10 Industrial Ave, Suite 3
Mahwah, NJ 07430
Phone: (908)447-4716
Kyle Richers
Real Estate Consultant

January 14th, 2015

Hand Delivered

Ms. Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

CC to Property Owner
Cumulus Media Inc.
3280 Peachtree Road, Atlanta, Georgia 30305

RE: Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 99 Briar Hill Road, Groton, CT 06430. Known to Sprint Spectrum L.P. as site CT33XC584.

Dear Ms. Bachman:

In order to accommodate technological changes, implement Code Division Multiple Access ("CDMA") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, Sprint Spectrum L.P. plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

CDMA employs Spread-Spectrum technology and special coding scheme to allow multiple users to be multiplexed over the same physical channel.

LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more CDMA transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons Sprint Spectrum L.P. respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (908)-447-4716 or email krichers@transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Kyle Richers
Real Estate Consultant

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY FCC REGULATORY COMPLIANCE MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT33XC584

Citadel / Groton

99 Briar Hill Road
Groton, CT 06340

January 12, 2015

EBI Project Number: 62150165

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

January 12, 2015

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT33XC584 - Citadel / Groton

Site Total: 7.60% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at **99 Briar Hill Road, Groton, CT**, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at **99 Briar Hill Road, Groton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 6 channels in the 1900 MHz Band were considered for each sector of the proposed installation.

2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation.

3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.

4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline for the proposed antennas is **187.5 feet** above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT33XC584 - Citadel / Groton
Site Addresss	99 Briar Hill Road, Groton, CT, 06340
Site Type	Guyed Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	5.9	187.5	181.5	1/2 "	0.5	0	416.08	0.45%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	187.5	181.5	1/2 "	0.5	0	39.00	0.08%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	187.5	181.5	1/2 "	0.5	0	138.69	0.27%
														Sector total Power Density Value:		0.80%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	5.9	187.5	181.5	1/2 "	0.5	0	416.08	0.45%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	187.5	181.5	1/2 "	0.5	0	39.00	0.08%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	187.5	181.5	1/2 "	0.5	0	138.69	0.27%
														Sector total Power Density Value:		0.80%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	5.9	187.5	181.5	1/2 "	0.5	0	416.08	0.45%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	187.5	181.5	1/2 "	0.5	0	39.00	0.08%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	187.5	181.5	1/2 "	0.5	0	138.69	0.27%
														Sector total Power Density Value:		0.80%

Site Composite MPE %	
Carrier	MPE %
Sprint	2.39%
WSUB	2.54%
WQGN	0.79%
WNLC	1.76%
MetroPCS	0.12%
Total Site MPE %	**7.60%**

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Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

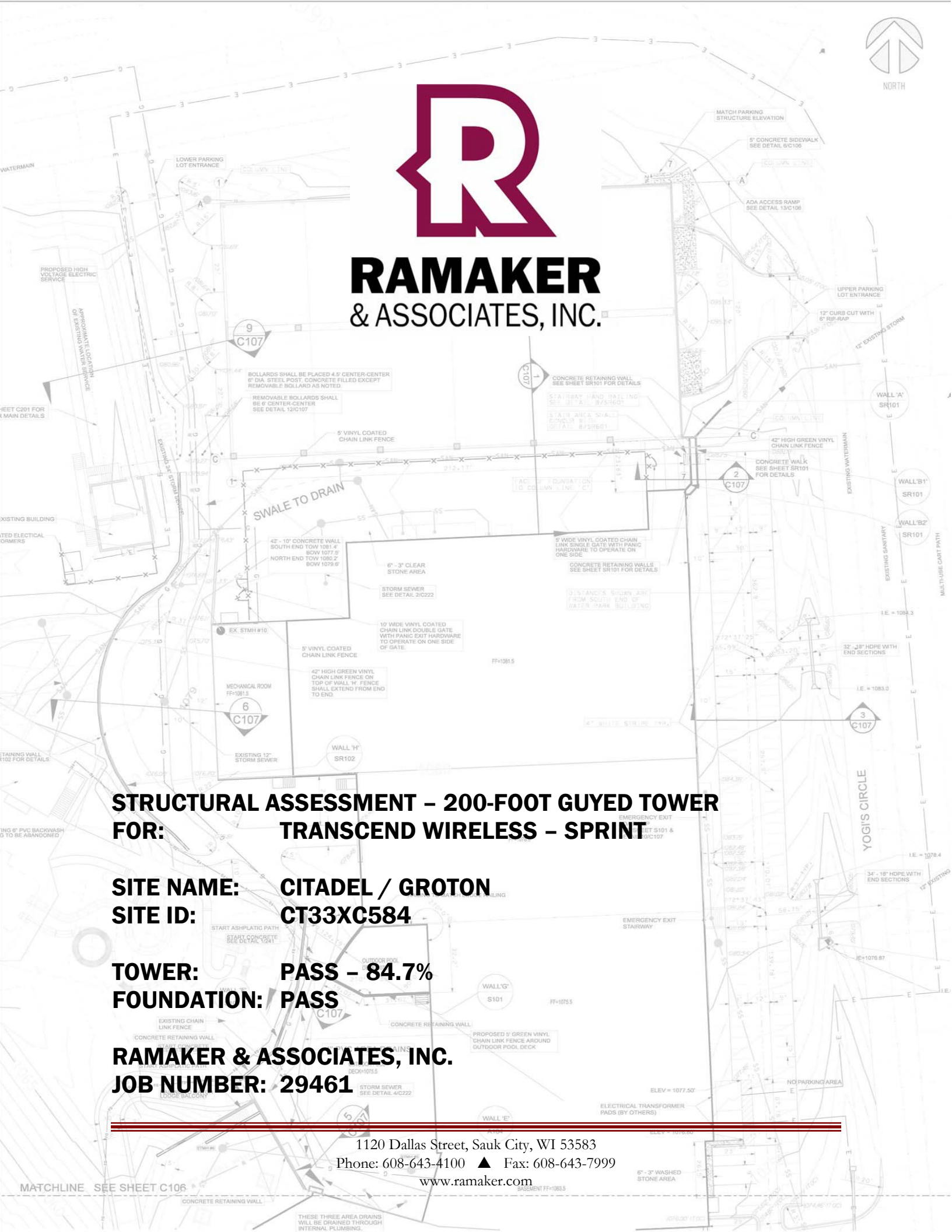
The anticipated Maximum Composite contributions from the Sprint facility are **2.39% (0.80% from sector 1, 0.80% from sector 2 and 0.80% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **7.60%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803



STRUCTURAL ASSESSMENT – 200-FOOT GUYED TOWER

FOR: TRANSCEND WIRELESS – SPRINT

SITE NAME: CITADEL / GROTON
SITE ID: CT33XC584

TOWER: PASS – 84.7%
FOUNDATION: PASS

RAMAKER & ASSOCIATES, INC.
JOB NUMBER: 29461

1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 ▲ Fax: 608-643-7999
www.ramaker.com

STRUCTURAL ASSESSMENT

SITE:	Citadel/Groton (CT33XC584) 99 Briar Hill Road Groton, New London County, Connecticut 06340
PREPARED FOR:	Transcend Wireless
CONTACT PERSON:	Mike Kithcart Transcend Wireless 48 Spruce Street, Oakland, NJ 07436
PREPARED BY:	Ramaker & Associates, Inc. 1120 Dallas Street Sauk City, Wisconsin 53583 Telephone: (608) 643-4100 Facsimile: (608) 643-7999
RAMAKER JOB NUMBER:	29461
DATE OF REPORT ISSUANCE:	August 13, 2014

Thomas E. Moore
Project Engineer

8/13/14
Date

James R. Skowronski, P.E.
Supervising Engineer

8/13/14
Date

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LIST OF APPENDICES

SECTION 1

EXECUTIVE SUMMARY

This report summarizes the structural analysis conducted by Ramaker & Associates, Inc. (RAMAKER) for Transcend Wireless on behalf of Sprint, who intends to install additional equipment on an existing tower.

The Sprint proposed loading includes removing the six (6) existing CDMA panel antennas and installing two (2) RFS APXVSPP18-C panel antennas, one (1) KMW ET-XU-42-15-37-18 panel antenna, three (3) Alcatel-Lucent 1900 MHz RRH units, three (3) Alcatel-Lucent 800 MHz RRH units, three (3) RFS APXV9TM-ALU-120 panel antennas, and three (3) Alcatel-Lucent TD-RRH 8x20 units on the existing delta mount at a centerline elevation of 187-feet AGL. The proposed antennas shall be fed with the three (3) new 1-1/4" hybrid cables and one (1) new 5/8" hybrid cable.

Results of our tower analysis show that the tower will be stressed to a maximum of 84.7 percent of capacity under proposed loading conditions. All proposed model foundation reactions are less than the original design reactions. Therefore, it is anticipated that the existing foundation will provide adequate strength under proposed loading conditions.

Results of our mount assessment show that by engineering calculation and inspection, the antenna and RRH mounting structure is capable of supporting the existing and proposed Sprint 2.5 equipment deployment without causing an overstress condition in the antenna and RRH mounting structure.

In summary, the tower will pass and the foundations will pass the TIA/EIA-222-F code requirements under proposed loading conditions. The mounting structure will pass the TIA-222 code requirements under proposed loading conditions.

SECTION 2
INTRODUCTION

2.1 PROJECT INFORMATION

This report summarizes the structural analysis conducted by Ramaker & Associates, Inc. (RAMAKER) for Transcend Wireless on behalf of Sprint, who intends to install additional equipment on an existing tower.

2.2 PURPOSE OF REPORT

The analysis activities of this report were conducted for the purposes of creating and analyzing a model of the subject structure under the required loading conditions. Base reactions from the resulting model were also determined for tower foundation and support development. Recommendations regarding the analysis results, loading configuration, and structural modifications are also provided.

2.3 SCOPE OF SERVICES

RAMAKER developed a finite element model (FEM) of the tower, using tnxTower, for member force, joint deflection, and structure reaction determinations. Subsequently, this report was drafted to provide our engineering recommendations. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the tower loading occur.

SECTION 3
MODEL DEVELOPMENT

3.1 INTRODUCTION

RAMAKER developed a FEM of the tower superstructure. Required static loads consisting of the antenna configuration, wind forces, ice loads, and linear appurtenances (including cable loads) were then applied to the FEM. As a result, all member forces, allowable capacities, and base reactions were computed. Additionally, potentially overstressed members were identified.

3.2 EXISTING STRUCTURE INFORMATION

Existing structure information was gathered from:

- Original tower drawings by Sabre, job number 04-12084, dated January 6, 2004.
- Previous structural analysis by Sabre, job number 04-12084, dated December 30, 2003.
- Previous structural analysis by Armor Tower Engineering, dated March 1, 2013.
- Previous structural modification analysis by Armor Tower Engineering, dated June 27, 2013.

3.3 TOWER LOADING

RAMAKER understands that the tower loading to be used for this analysis will consist of the existing and proposed antenna, mount, and cable configurations as shown in the following chart:

Elevation	Appurtenance	Mount	Coax	Owner	Status
250	4' Lightning Rod	Top of Antenna Pole	-	Tower	Existing
	(1) Large Beacon		3/4" Conduit		
245-230	Shively Labs 6810 (4 Bay)	Antenna Pole	(2) 1-5/8	WQGN-FM	Existing
220-210	Shively Labs 6810 (3 Bay)			WNLC-FM	
199	(1) Kathrein PR-950 Grid Dish	Leg Mount	(1) 1-5/8	-	Existing
187	(2) Decibel DB844G65ZAXY	(1) Delta Mount	(6) 1-5/8	Sprint (CDMA)	Existing (Remove)
	(1) Decibel DB980H0E-M				
	(2) RFS APXVSPP18-C		(3) 1-1/4 Hybrid	Sprint (Network/ Vision)	Proposed
	(1) KMW ET-XU-42-15-37-18				
	(3)Alcatel-Lucent 1900 MHz RRH				
	(3) Alcatel-Lucent 800 MHz RRH				
	(3) RFS APXV9TM14-ALU-120		(1) 5/8 Hybrid	Sprint (2.5)	Proposed
	(3) Alcatel-Lucent TD-RRH 8x20				
177	(3) Kathrein 742-351	(3) T-Frames	(6) 1-5/8	Metro PCS	Existing
172	(1) Kathrein PR-950 Grid Dish	Leg Mount	(1) 7/8	-	Existing
150	(1) 4' Grid Dish	Leg Mount	(1) 1/2	-	Existing
130	(1) 8' Omni	(1) 2' Stand-off	(1) 7/8	-	Existing
123	(3) Beacon Spurs	Leg Mount	3/4" Conduit	Tower	Existing
170-10	(3) Tuning Wires	Leg Mount	-	WQGN-FM	Existing

3.4 WIND AND ICE LOAD

Wind forces used in model development are in compliance with the TIA/EIA-222-F Standard. These guidelines call for an analysis to be performed which assumes a basic wind speed of 85 miles-per-hour (mph) without ice in New London County. The tower is also designed for a 38 mph basic wind speed with 0.75-inch of radial ice.

SECTION 4
ANALYSIS RESULTS

4.1 ANALYSIS RESULTS

The tower superstructure was analyzed with the combined existing and proposed antenna loading with and without radial ice. The computed maximum tower member stress capacities are as follows:

Component Type	Percent Capacity
Pole	66.1
Leg	59.9
Diagonal	84.7
Horizontal	18.7
Guy Line	79.7
Bolt	11.5
Torque Arm	65.6
RATING =	**84.7**

4.2 BASE REACTIONS

The computed maximum reactions are as follows:

Load Type	Original Design	Proposed Model
Base Axial (k)	101.0	83.3
Base Shear (k)	2.3	1.7
Guy Anchor Uplift (k)	39.1	29.5
Guy Anchor Lateral (k)	42.6	32.1

All proposed model foundation reactions are less than the original design reactions. Therefore, it is anticipated that the existing foundation will provide adequate strength under proposed loading conditions.

4.3 MOUNT ASSESSMENT

By engineering calculation and inspection, the antenna mounting structure is capable of supporting the existing and proposed Sprint 2.5 equipment deployment without causing an overstress condition in the antenna mounting structure.

This assessment is inclusive of the entire antenna mounting structure, including tower platforms, arms, and all other aspects of the mounting structure that will support the Sprint 2.5 equipment deployment. This assessment assumes that the mounting structure(s) has been installed correctly, is free from deterioration, and is maintained properly.

SECTION 5
LIMITATIONS

The recommendations contained within this report were developed using general project information provided by the owner, tower manufacturer, general field observations, reference information and laboratory testing data, as applicable. All recommendations pertain only to the proposed tower construction, location, and loading as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

1. Missing, corroding, and/or deteriorating members
2. Improper manufacturing and/or construction
3. Improper maintenance

RAMAKER assumes no responsibility for modifications completed prior to or hereafter in which RAMAKER was not directly involved. These modifications include but are not limited to the following:

1. Replacing or strengthening bracing members
2. Reinforcing or extending vertical members
3. Installing or removing antenna mounting gates or side arms
4. Changing loading configurations

Furthermore, RAMAKER hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations and conclusions are based on the information contained and set forth herein. If you are aware of any information contrary to that contained herein, or if you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact RAMAKER. RAMAKER isn't liable for any representation, recommendation or conclusion not expressly stated herein.

The tower owner is responsible for verifying that the existing loading on the tower is consistent with the loading applied to the tower within this report.

SECTION 6
REFERENCES

1. 2003 International Building Code.

2. Telecommunications Industries Association, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA Standard TIA/EIA-222-F 1996, Washington, D.C.

APPENDIX A

TOWER FIGURES

Section		L1	250.0 ft
Legs		P12x.5	
Leg Grade		A53-B-35	
Diagonals	N.A.	N.A.	
Diagonal Grade	N.A.	N.A.	
Top Girts	8x3/8	N.A.	
Bottom Girts	8x3/8	N.A.	
Horizontals	8x3/8	N.A.	
Sec. Horizontals	N.A.	N.A.	
Top Guy Pull-Offs		1.0625	
Face Width (ft)	0.5		
# Panels @ (ft)	A	N.A.	
Weight (lb)	484.6	3273.9	

Section		T1	200.0 ft
Legs		3	
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts	L3x3x3/8	SR 1	186.8 ft
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs			
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1426.4	

Section		T2	180.0 ft
Legs			
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts		N.A.	
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs			
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1001.5	

Section		T3	160.0 ft
Legs			
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs			
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1001.5	

Section		T4	140.0 ft
Legs			
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs		3 1/2x3/8	126.8 ft
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1041.7	

Section		T5	120.0 ft
Legs		SR 2	
Leg Grade		A572-50	
Diagonals		SR 1	
Diagonal Grade		A36	
Top Girts		SR 7/8	
Bottom Girts		SR 7/8	
Horizontals		SR 7/8	
Sec. Horizontals		SR 7/8	
Top Guy Pull-Offs		N.A.	
Face Width (ft)			
# Panels @ (ft)		58 @ 3.25	
Weight (lb)		1001.5	

Section		T6	100.0 ft
Legs			
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs			
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1001.5	

Section		T7	80.0 ft
Legs			
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs		3 1/2x3/8	66.8 ft
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1041.7	

Section		T8	60.0 ft
Legs			
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs			
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1001.5	

Section		T9	40.0 ft
Legs			
Leg Grade			
Diagonals			
Diagonal Grade			
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs		N.A.	
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		1001.5	

Section		T10	20.0 ft
Legs			
Leg Grade			
Diagonals		SR 1 1/4	
Diagonal Grade			
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs			
Face Width (ft)			
# Panels @ (ft)			
Weight (lb)		873.9	

Section		T11	6.5 ft
Legs		SR 2 1/4	
Leg Grade			
Diagonals	N.A.		
Diagonal Grade	N.A.		
Top Girts			
Bottom Girts			
Horizontals			
Sec. Horizontals			
Top Guy Pull-Offs			
Face Width (ft)			
# Panels @ (ft)	A		
Weight (lb)	14151.2	484.6	0.0 ft

1656 lb

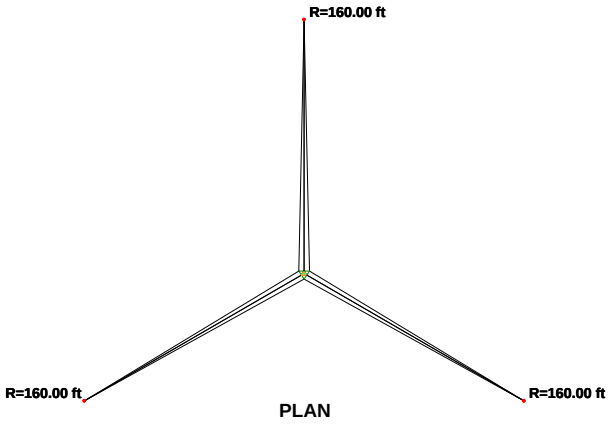
83255 lb (Axial)
1201 lb-ft (Torque)

9/16 EHS LC=244.81 ft IT=10%

9/16 EHS LC=244.81 ft IT=10%

9/16 EHS LC=202.77 ft IT=10%

7/16 EHS LC=171.77 ft IT=10%



PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4' (tower)	252	8'x2" Antenna Mount Pipe (Sprint NV)	187
Flash Beacon Lighting (tower)	250	APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint 2.5)	187
6810 ((4 Bay Array))	237.5	APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint 2.5)	187
6810-2 ((3 Bay Array))	215	APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint 2.5)	187
PR-950	199	TD-RRH 8x20 (Sprint 2.5)	187
(2) DB844G65ZAXY w/Mount Pipe (Sprint CDMA)	187	TD-RRH 8x20 (Sprint 2.5)	187
(2) DB844G65ZAXY w/Mount Pipe (Sprint CDMA)	187	TD-RRH 8x20 (Sprint 2.5)	187
(2) DB980H90E-M w/Mount Pipe (Sprint CDMA)	187	Pirod Delta Mount (3)	187
APXVSPP18-C w/Mount Pipe (Sprint NV)	187	Sabre 12' T-Boom (1) (Ramaker)	177
APXVSPP18-C w/Mount Pipe (Sprint NV)	187	Sabre 12' T-Boom (1) (Ramaker)	177
P40-16XLPP-RR w/Mount Pipe (Sprint NV)	187	742-351 w/ Mount Pipe (Metro-PCS)	177
1900MHz 4x40W RRH (Sprint NV)	187	742-351 w/ Mount Pipe (Metro-PCS)	177
1900MHz 4x40W RRH (Sprint NV)	187	742-351 w/ Mount Pipe (Metro-PCS)	177
1900MHz 4x40W RRH (Sprint NV)	187	Sabre 12' T-Boom (1) (Ramaker)	177
800MHz 2x50W RRH (Sprint NV)	187	PR-950	172
800MHz 2x50W RRH (Sprint NV)	187	4' Grid Dish	150
800MHz 2x50W RRH (Sprint NV)	187	2' Standoff	130
8'x2" Antenna Mount Pipe (Sprint NV)	187	8' Omni	130
8'x2" Antenna Mount Pipe (Sprint NV)	187	Small Beacon (tower)	123
		Small Beacon (tower)	123
		Small Beacon (tower)	123

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	4 @ 1.77778		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 84.7%

29535 lb

43608 lb

32084 lb

R=160.00 ft

RAMAKER & ASSOCIATES, INC.
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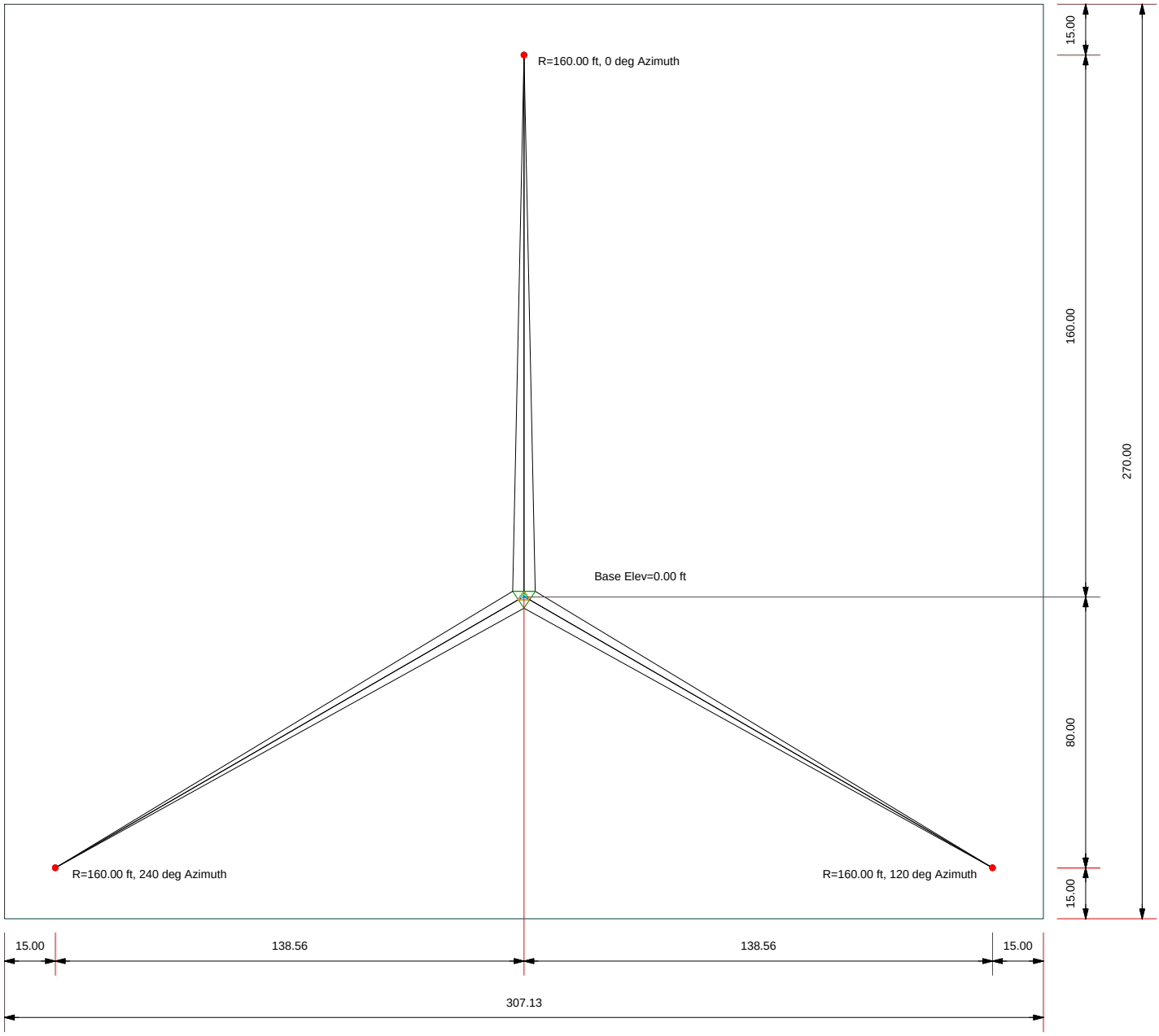
Phone: (608) 643-4100
FAX: (608) 643-7999

Job: *Citadel / Groton (CT33XC584)*			
Project: *29461*			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-1	

Plot Plan
Total Area - 1.90 Acres



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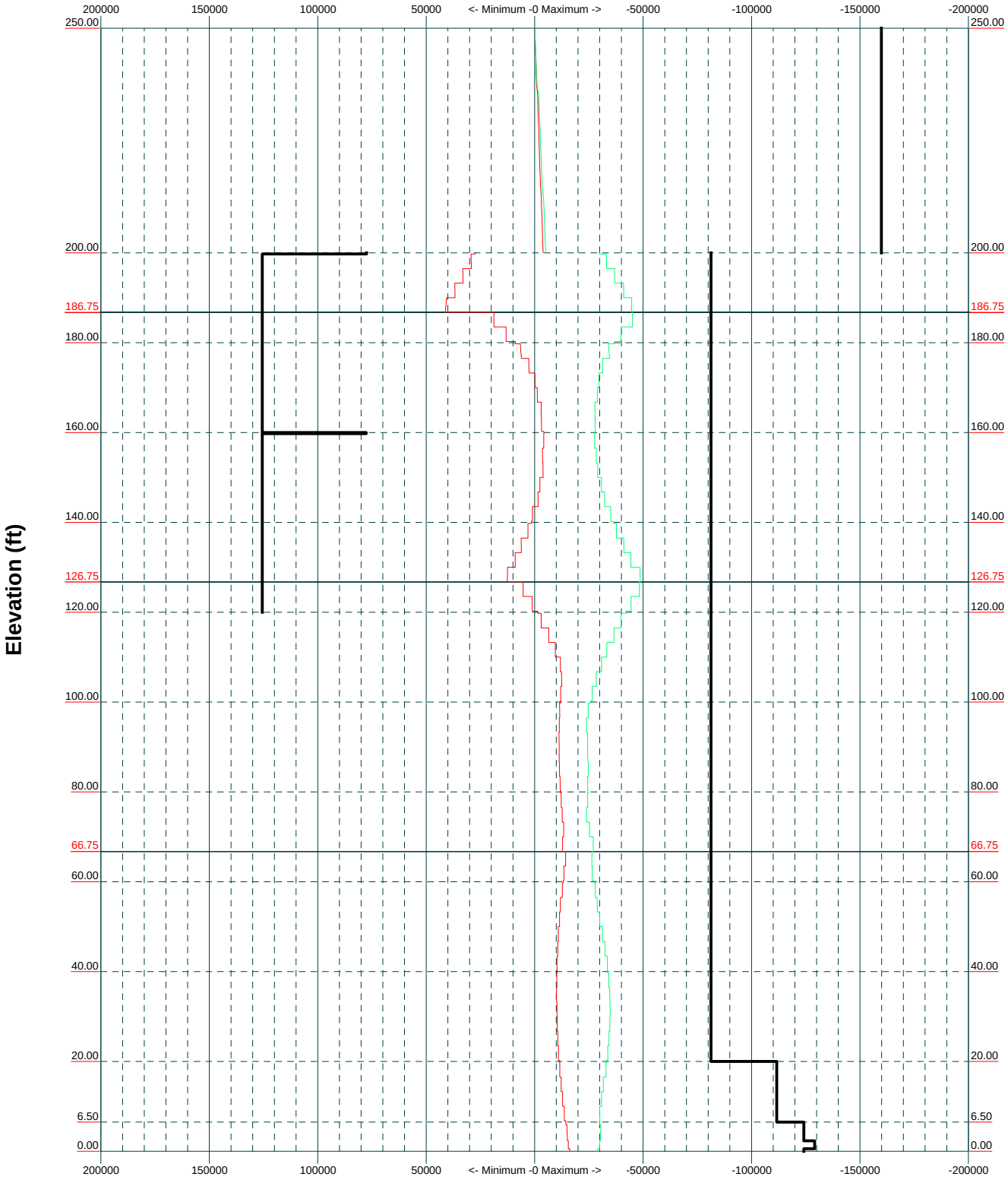
Project: ***29461***			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-2	

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Leg Capacity ——— **Leg Compression (lb)**



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Job: ***Citadel / Groton (CT33XC584)***			
Project: ***29461***			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-3	

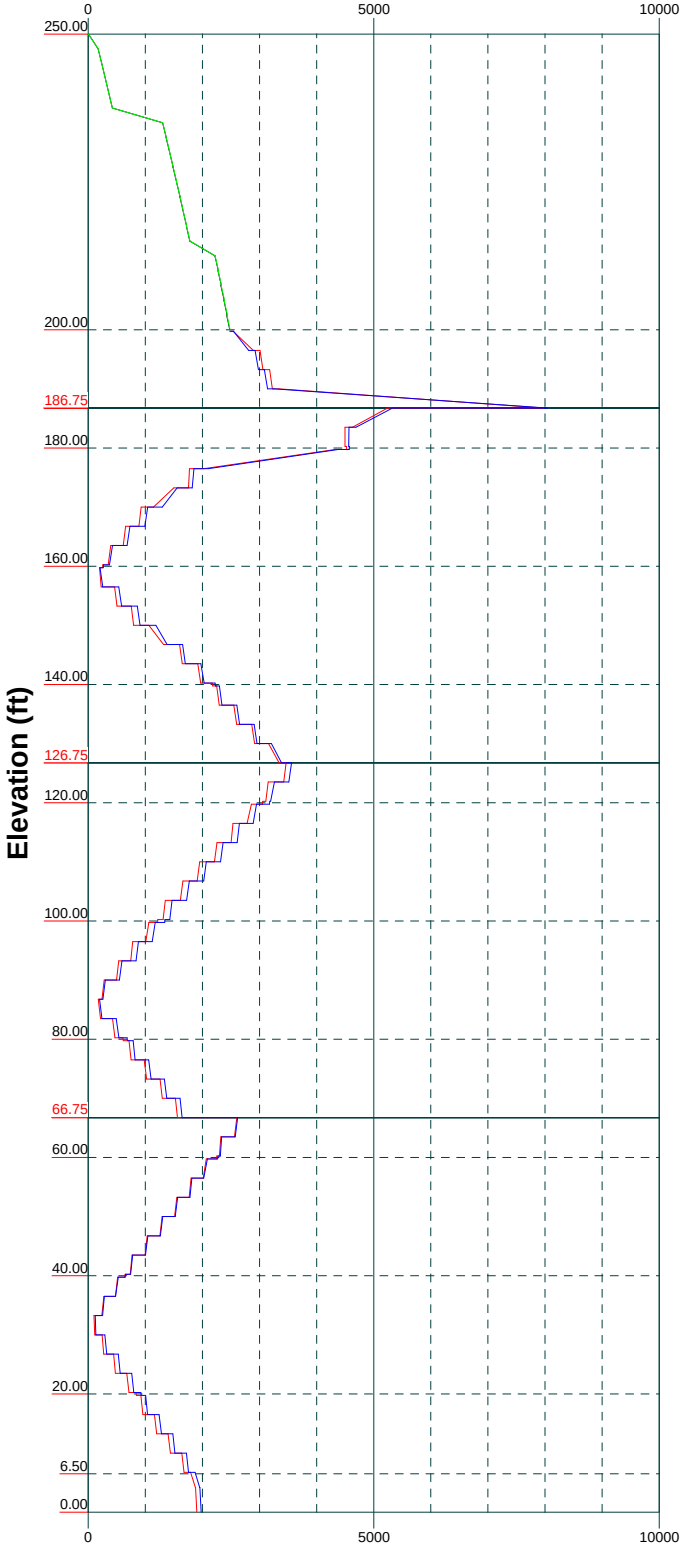
TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Vx Vz

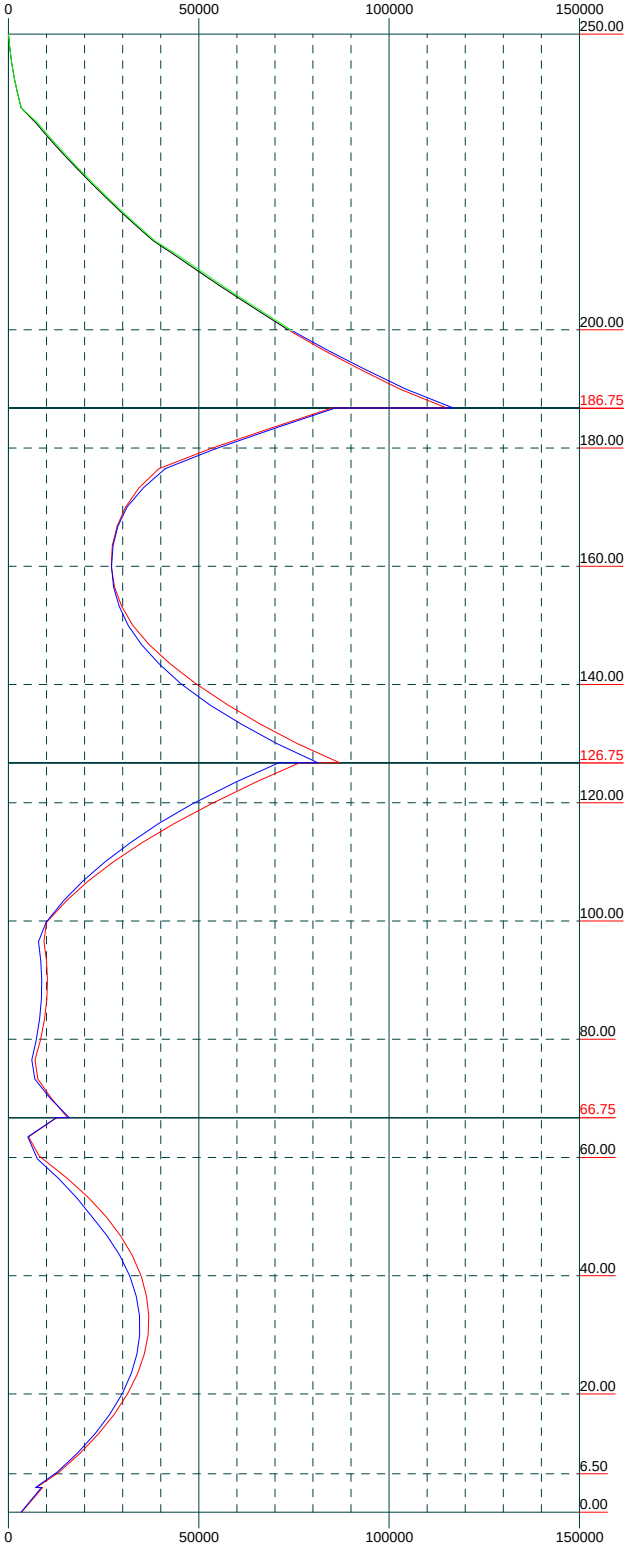
Maximum Values

Mx Mz

Global Mast Shear (lb)



Global Mast Moment (lb-ft)



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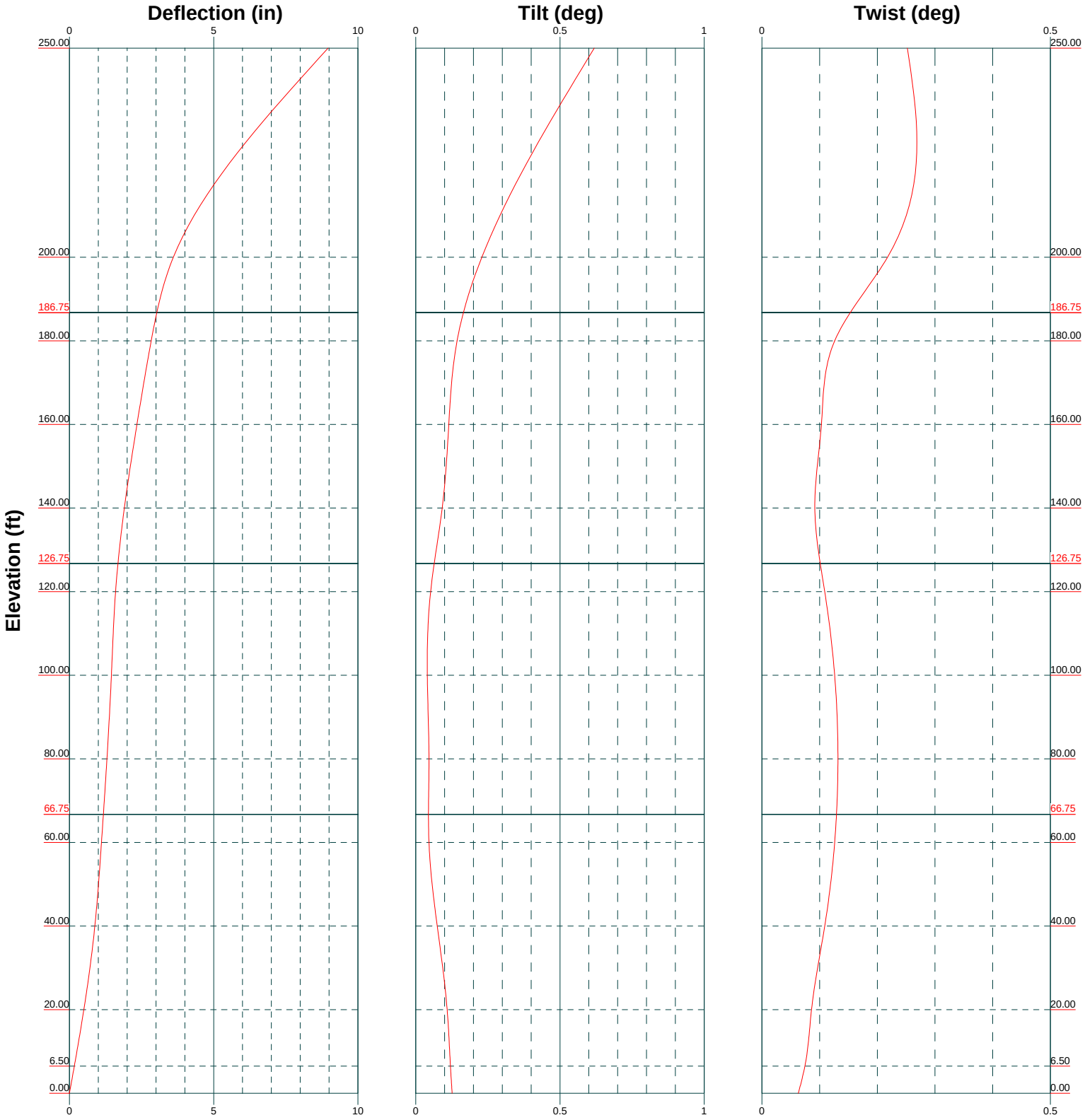
Project: *29461*			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-4	

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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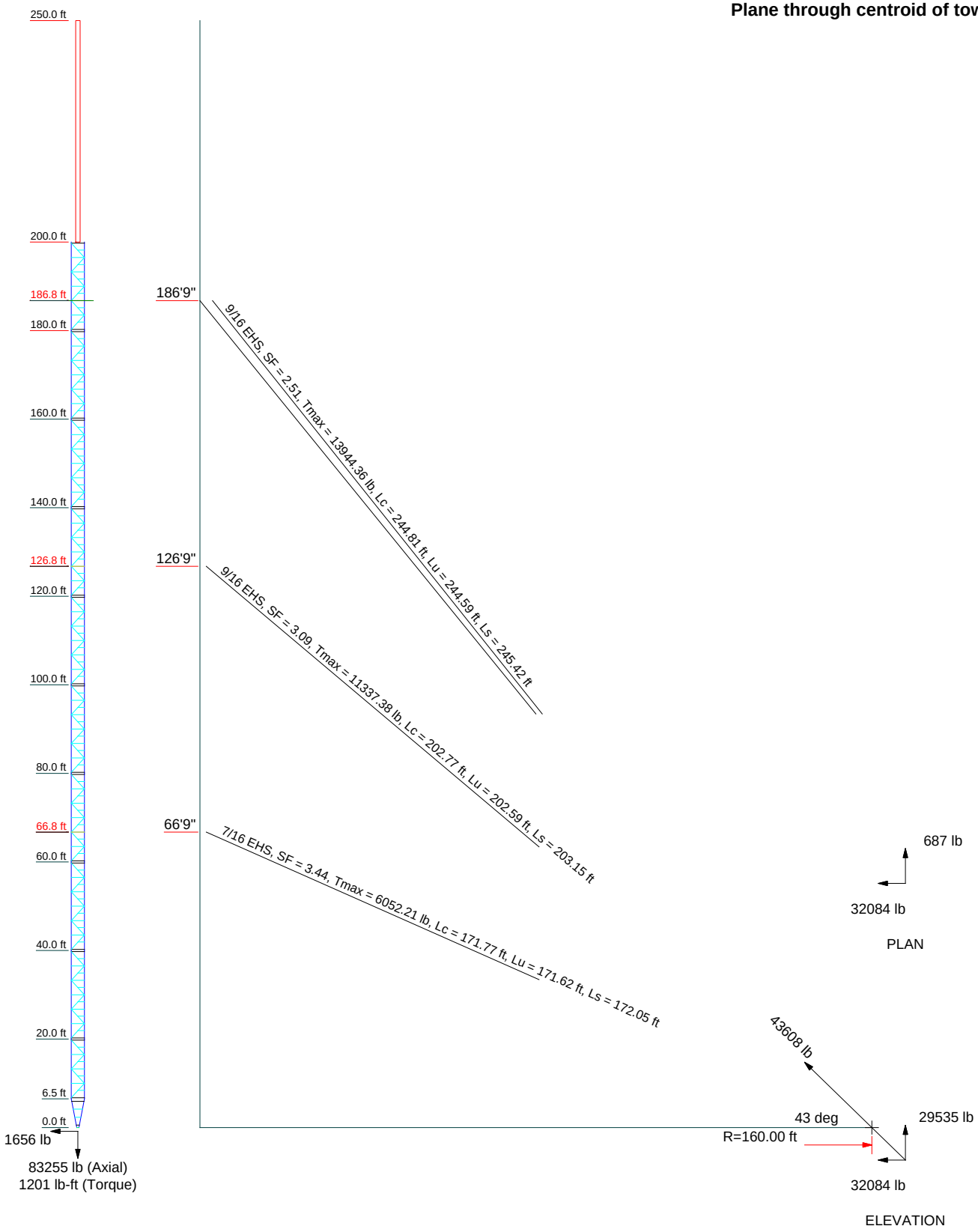
Project: ***29461***			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-5	

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Maximum Values
Anchor 'C'@160 ft Azimuth 240 deg Elev 0 ft
Plane through centroid of tower



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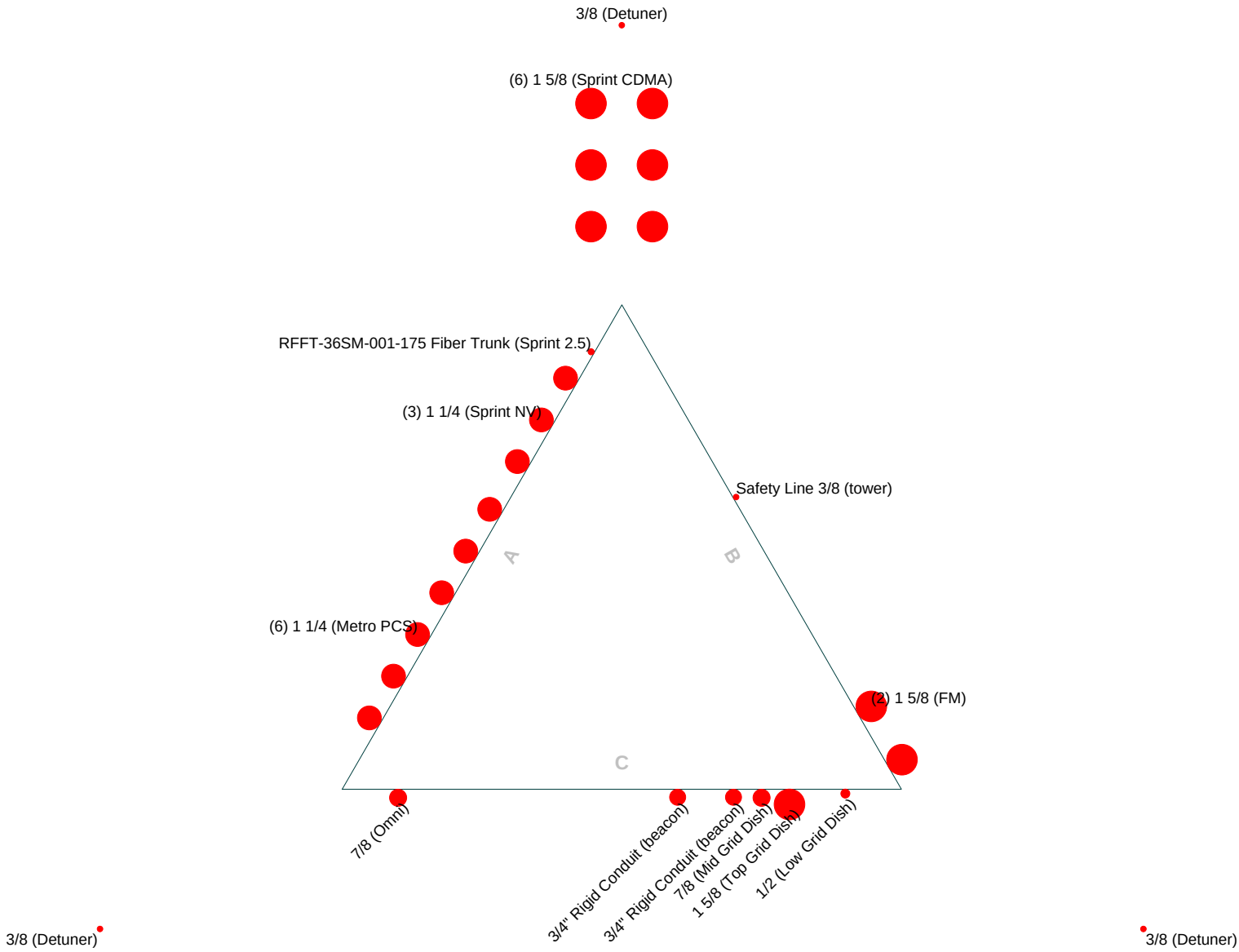
Project: ***29461***			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-6	

Feed Line Plan

Round Flat App In Face App Out Face



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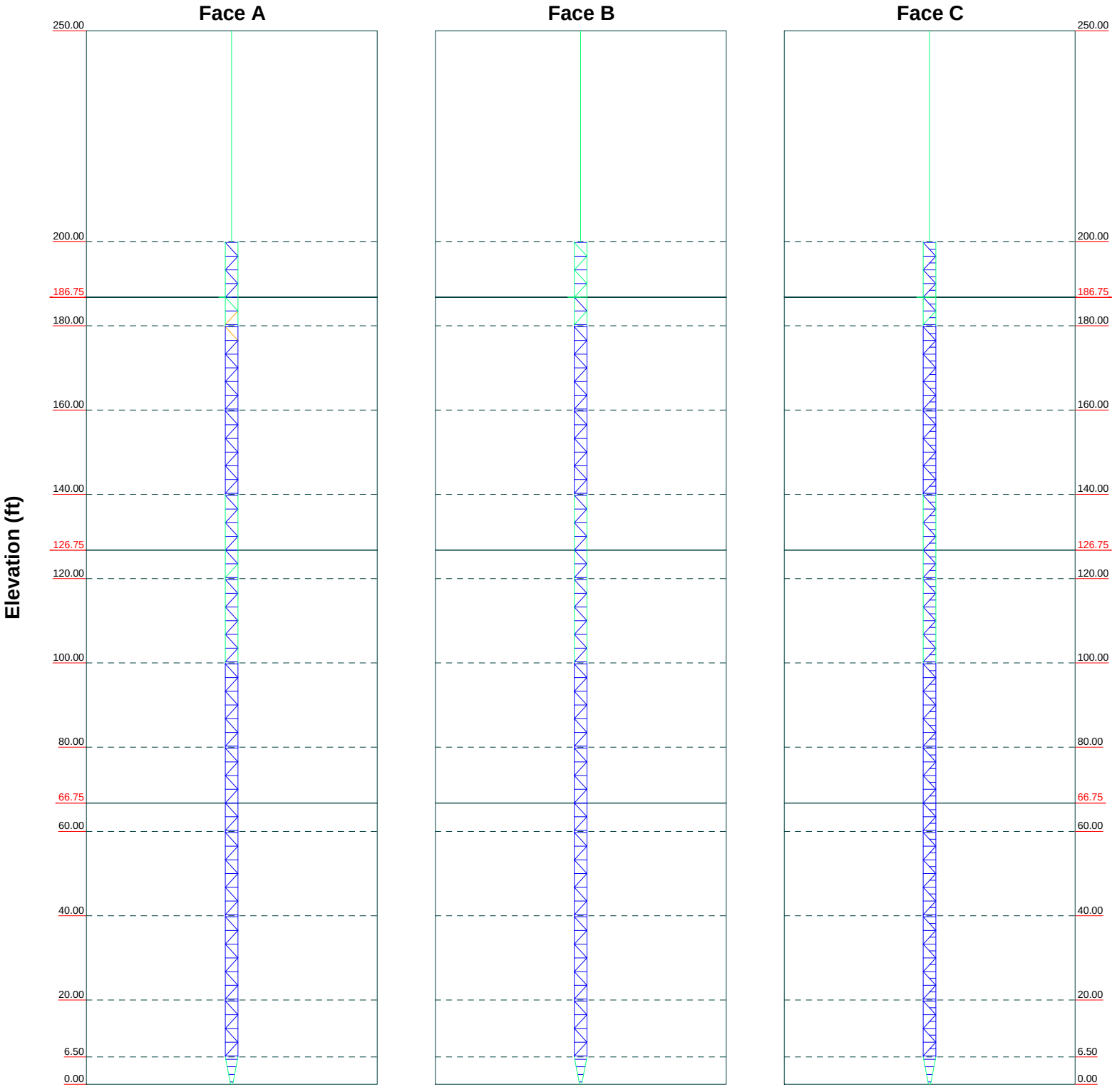
Project: ***29461***			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-7	

Stress Distribution Chart
0' - 250'

> 100% 90%-100% 75%-90% 50%-75% < 50% Overstress



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Job: ***Citadel / Groton (CT33XC584)***			
Project: ***29461***			
Client: Sprint	Drawn by: tmoore	App'd:	
Code: TIA/EIA-222-F	Date: 08/13/14	Scale: NTS	
Path: I:\29400\29461\Structural\tnx\29461 rev0.eri		Dwg No. E-8	

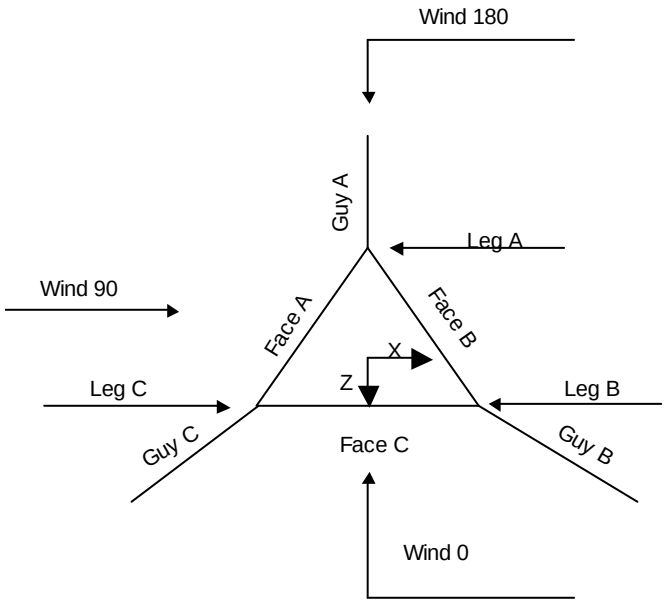
APPENDIX B

TOWER CALCULATIONS

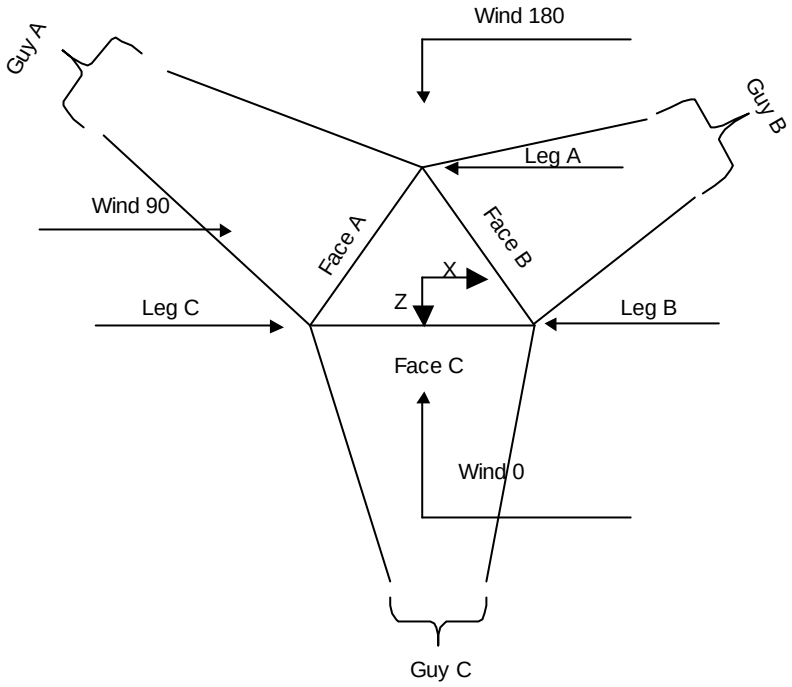
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 250.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.00 ft at the top and 0.50 ft at the base.
An index plate is provided at the 3x guyed -tower connection.
There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.0664.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Corner & Starmount Guyed Tower



Face Guyed

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	250.00-200.00	50.00	P12x.5	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 250.00-200.00				1	1	1		

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	200.00-180.00			3.00	1	20.00
T2	180.00-160.00			3.00	1	20.00
T3	160.00-140.00			3.00	1	20.00
T4	140.00-120.00			3.00	1	20.00
T5	120.00-100.00			3.00	1	20.00
T6	100.00-80.00			3.00	1	20.00
T7	80.00-60.00			3.00	1	20.00
T8	60.00-40.00			3.00	1	20.00
T9	40.00-20.00			3.00	1	20.00
T10	20.00-6.50			3.00	1	13.50
T11	6.50-0.00			3.00	1	6.50

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	200.00-180.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T2	180.00-160.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T3	160.00-140.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T4	140.00-120.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T5	120.00-100.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T6	100.00-80.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T7	80.00-60.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T8	60.00-40.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T9	40.00-20.00	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T10	20.00-6.50	3.25	K Brace Left	No	Yes+Steps	3.0000	3.0000
T11	6.50-0.00	1.78	K Brace Left	No	Yes	7.0000	7.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 200.00-180.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T2 180.00-160.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T3 160.00-140.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T4 140.00-120.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T5 120.00-100.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T6 100.00-80.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T7 80.00-60.00	Solid Round	2	A572-50	Solid Round	1	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T8 60.00-40.00	Solid Round	2	(50 ksi) A572-50 (50 ksi)	Solid Round	1	(36 ksi) A36 (36 ksi)
T9 40.00-20.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T10 20.00-6.50	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T11 6.50-0.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 200.00-180.00	Equal Angle	L3x3x3/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T2 180.00-160.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 160.00-140.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 140.00-120.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T5 120.00-100.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T6 100.00-80.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T7 80.00-60.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T8 60.00-40.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T9 40.00-20.00	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T10 20.00-6.50	Solid Round	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T11 6.50-0.00	Flat Bar	8x3/8	A36 (36 ksi)	Flat Bar	8x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 200.00-180.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T2 180.00-160.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 160.00-140.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 140.00-120.00	None	Solid Round		A572-50	Solid Round	7/8	A36

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T5 120.00-100.00	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(36 ksi) A36 (36 ksi)
T6 100.00-80.00	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(36 ksi) A36 (36 ksi)
T7 80.00-60.00	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(36 ksi) A36 (36 ksi)
T8 60.00-40.00	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(36 ksi) A36 (36 ksi)
T9 40.00-20.00	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(36 ksi) A36 (36 ksi)
T10 20.00-6.50	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(36 ksi) A36 (36 ksi)
T11 6.50-0.00	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Flat Bar	8x3/8	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 200.00-180.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 180.00-160.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T3 160.00-140.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 140.00-120.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 120.00-100.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 100.00-80.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 80.00-60.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T8 60.00-40.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T9 40.00-20.00	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T10 20.00-6.50	Solid Round	7/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 200.00-180.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T2 180.00-160.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-6.50	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 6.50-0.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 200.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-6.50	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 6.50-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 200.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-6.50	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 6.50-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 200.00-180.00	Flange	0.7500 A325N	3	0.6250 A325X	0	0.6250 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T2 180.00-160.00	Flange	0.7500 A325N	3	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T3 160.00-140.00	Flange	0.7500 A325N	3	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T4 140.00-120.00	Flange	0.7500 A325N	3	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T5 120.00-100.00	Flange	0.7500 A325N	3	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T6 100.00-80.00	Flange	0.7500 A325N	3	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T7 80.00-60.00	Flange	0.7500 A325N	3	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T8 60.00-40.00	Flange	0.7500 A325N	3	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T9 40.00-20.00	Flange	0.7500 A325N	3	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T10 20.00-6.50	Flange	0.7500 A325N	0	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T11 6.50-0.00	Flange	0.7500 A325N	0	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
186.75	EHS	A	9/16	3500.00	10%	21000	0.671	244.61	160.00	0.0000	0.00	100%
		B	9/16	3500.00	10%	21000	0.671	244.61	160.00	0.0000	0.00	100%
		C	9/16	3500.00	10%	21000	0.671	244.61	160.00	0.0000	0.00	100%
126.75	EHS	A	9/16	3500.00	10%	21000	0.671	202.60	160.00	0.0000	0.00	100%
		B	9/16	3500.00	10%	21000	0.671	202.60	160.00	0.0000	0.00	100%
		C	9/16	3500.00	10%	21000	0.671	202.60	160.00	0.0000	0.00	100%
66.75	EHS	A	7/16	2080.00	10%	21000	0.399	171.63	160.00	0.0000	0.00	100%
		B	7/16	2080.00	10%	21000	0.399	171.63	160.00	0.0000	0.00	100%
		C	7/16	2080.00	10%	21000	0.399	171.63	160.00	0.0000	0.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
186.75	Torque Arm	6.00	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7
126.75	Corner						
66.75	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
186.75	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Solid Round	1
126.75	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Flat Bar	3 1/2x3/8
66.75	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Flat Bar	3 1/2x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
186.75	164.13	164.13	164.13		5.64 4.1 sec/pulse	5.64 4.1 sec/pulse	5.64 4.1 sec/pulse	
126.75	135.94	135.94	135.94		3.89 3.4 sec/pulse	3.89 3.4 sec/pulse	3.89 3.4 sec/pulse	
66.75	68.48	68.48	68.48		2.81 2.9 sec/pulse	2.81 2.9 sec/pulse	2.81 2.9 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
186.75	Yes	Yes	1	1	1	1	1	1
126.75	No	No			1	1	1	1
66.75	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
186.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
126.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
66.75	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
186.75	A	93.38	25	5	0.8497
	B	93.38	25	5	0.8497
	C	93.38	25	5	0.8497
126.75	A	63.38	22	4	0.8111
	B	63.38	22	4	0.8111
	C	63.38	22	4	0.8111
66.75	A	33.38	19	4	0.7510
	B	33.38	19	4	0.7510
	C	33.38	19	4	0.7510

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
186.75	A	49.7141	3625.20 3500.00	-43.65	2799.59	-2302.71	-4849.03	6983.72	-8398.77
	A	49.7141	3625.20	43.65	2799.59	-2302.71	-4849.03	-6983.72	8398.77

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
			3500.00						
	B	49.7141	3625.20	2016.03	2799.59	1113.55	9698.07	6983.72	0.00
			3500.00						
	B	49.7141	3625.20	1972.38	2799.59	1189.15	-4849.03	-6983.72	-8398.77
			3500.00						
	C	49.7141	3625.20	-1972.38	2799.59	1189.15	-4849.03	6983.72	8398.77
			3500.00						
	C	49.7141	3625.20	-2016.03	2799.59	1113.55	9698.07	-6983.72	0.00
			3500.00						
			Sum:	0.00	16797.55	0.00	-0.00	0.00	0.00
126.75	A	38.6897	3584.98	0.00	2282.31	-2764.62	-3953.07	0.00	0.00
			3500.00						
	B	38.6897	3584.98	2394.23	2282.31	1382.31	1976.54	0.00	-3423.46
			3500.00						
	C	38.6897	3584.98	-2394.23	2282.31	1382.31	1976.54	-0.00	3423.46
			3500.00						
			Sum:	0.00	6846.92	-0.00	0.00	0.00	0.00
66.75	A	22.8677	2106.61	0.00	847.68	-1928.54	-1468.22	0.00	0.00
			2080.00						
	B	22.8677	2106.61	1670.16	847.68	964.27	734.11	0.00	-1271.51
			2080.00						
	C	22.8677	2106.61	-1670.16	847.68	964.27	734.11	-0.00	1271.51
			2080.00						
			Sum:	0.00	2543.03	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
186.75	A	49.7141	5607.27	-66.21	4386.01	-3492.86	-7596.79	10593.24	-13158.02
			5208.58						
	A	49.7141	5607.27	66.21	4386.01	-3492.86	-7596.79	-10593.24	13158.02
			5208.58						
	B	49.7141	5607.27	3058.01	4386.01	1689.09	15193.58	10593.24	0.00
			5208.58						
	B	49.7141	5607.27	2991.80	4386.01	1803.77	-7596.79	-10593.24	-13158.02
			5208.58						
	C	49.7141	5607.27	-2991.80	4386.01	1803.77	-7596.79	10593.24	13158.02
			5208.58						
	C	49.7141	5607.27	-3058.01	4386.01	1689.09	15193.58	-10593.24	0.00
			5208.58						
			Sum:	0.00	26316.05	0.00	-0.00	0.00	0.00
126.75	A	38.6897	5464.92	0.00	3541.05	-4162.49	-6133.29	0.00	0.00
			5207.60						
	B	38.6897	5464.92	3604.82	3541.05	2081.24	3066.64	0.00	-5311.58
			5207.60						
	C	38.6897	5464.92	-3604.82	3541.05	2081.24	3066.64	-0.00	5311.58
			5207.60						
			Sum:	0.00	10623.16	-0.00	0.00	0.00	0.00
66.75	A	22.8677	3355.36	0.00	1412.15	-3043.73	-2445.92	0.00	0.00
			3256.04						

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
	B	22.8677	3355.36 3256.04	2635.94	1412.15	1521.86	1222.96	0.00	-2118.23
	C	22.8677	3355.36 3256.04	-2635.94	1412.15	1521.86	1222.96	-0.00	2118.23
			Sum:	0.00	4236.46	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
186.75	A	49.7141	3625.20 3500.00	-43.65	2799.59	-2302.71	-4849.03	6983.72	-8398.77
	A	49.7141	3625.20 3500.00	43.65	2799.59	-2302.71	-4849.03	-6983.72	8398.77
	B	49.7141	3625.20 3500.00	2016.03	2799.59	1113.55	9698.07	6983.72	0.00
	B	49.7141	3625.20 3500.00	1972.38	2799.59	1189.15	-4849.03	-6983.72	-8398.77
	C	49.7141	3625.20 3500.00	-1972.38	2799.59	1189.15	-4849.03	6983.72	8398.77
	C	49.7141	3625.20 3500.00	-2016.03	2799.59	1113.55	9698.07	-6983.72	0.00
			Sum:	0.00	16797.55	0.00	-0.00	0.00	0.00
126.75	A	38.6897	3584.98 3500.00	0.00	2282.31	-2764.62	-3953.07	0.00	0.00
	B	38.6897	3584.98 3500.00	2394.23	2282.31	1382.31	1976.54	0.00	-3423.46
	C	38.6897	3584.98 3500.00	-2394.23	2282.31	1382.31	1976.54	-0.00	3423.46
			Sum:	0.00	6846.92	-0.00	0.00	0.00	0.00
66.75	A	22.8677	2106.61 2080.00	0.00	847.68	-1928.54	-1468.22	0.00	0.00
	B	22.8677	2106.61 2080.00	1670.16	847.68	964.27	734.11	0.00	-1271.51
	C	22.8677	2106.61 2080.00	-1670.16	847.68	964.27	734.11	-0.00	1271.51
			Sum:	0.00	2543.03	0.00	0.00	0.00	0.00

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning: 0 F Initial Tension	0 F Intercept	20 F Initial Tension	20 F Intercept	40 F Initial Tension	40 F Intercept	60 F Initial Tension	60 F Intercept	80 F Initial Tension	80 F Intercept	100 F Initial Tension	100 F Intercept	120 F Initial Tension	120 F Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
186.75	A	158.30	186.75	4125	4.80	3915	5.05	3706	5.33	3500	5.64	3297	5.98	3097	6.36	2901	6.78
	B	158.30	186.75	4125	4.80	3915	5.05	3706	5.33	3500	5.64	3297	5.98	3097	6.36	2901	6.78
	C	158.30	186.75	4125	4.80	3915	5.05	3706	5.33	3500	5.64	3297	5.98	3097	6.36	2901	6.78

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
126.75	A	158.27	126.75	4415	3.09	4106	3.32	3801	3.59	3500	3.89	3206	4.24	2919	4.66	2643	5.13
	B	158.27	126.75	4415	3.09	4106	3.32	3801	3.59	3500	3.89	3206	4.24	2919	4.66	2643	5.13
	C	158.27	126.75	4415	3.09	4106	3.32	3801	3.59	3500	3.89	3206	4.24	2919	4.66	2643	5.13
66.75	A	158.27	66.75	2842	2.06	2584	2.26	2330	2.51	2080	2.81	1837	3.18	1605	3.64	1388	4.20
	B	158.27	66.75	2842	2.06	2584	2.26	2330	2.51	2080	2.81	1837	3.18	1605	3.64	1388	4.20
	C	158.27	66.75	2842	2.06	2584	2.26	2330	2.51	2080	2.81	1837	3.18	1605	3.64	1388	4.20

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8 (tower)	B	Yes	Ar (CfAe)	200.00 - 6.50	0.0000	-0.1	1	1	0.3750	0.3750		0.22
3/4" Rigid Conduit (beacon)	C	Yes	Ar (CfAe)	200.00 - 6.50	0.0000	-0.1	1	1	1.0500	1.0500		1.05
3/4" Rigid Conduit (beacon)	C	Yes	Ar (CfAe)	123.00 - 6.50	0.0000	-0.2	1	1	1.0500	1.0500		1.05
*****												
1 5/8 (Top Grid Dish)	C	Yes	Ar (CfAe)	200.00 - 6.50	0.0000	-0.3	1	1	1.9800	1.9800		1.04
1 5/8 (FM)	B	Yes	Ar (CfAe)	200.00 - 6.50	0.0000	0.4	2	2	1.9800	1.9800		1.04
1 5/8 (Sprint CDMA)	A	No	Ar (Leg)	187.00 - 6.50	0.0000	-0.25	6	3	1.9800	1.9800		1.04
1 1/4 (Sprint NV)	A	Yes	Ar (CfAe)	187.00 - 6.50	0.0000	0.25	3	3	1.5500	1.5500		0.66
RFFT-36SM-001-175 Fiber Trunk (Sprint 2.5)	A	Yes	Ar (CfAe)	187.00 - 6.50	0.0000	0.4	1	1	0.4000	0.4000		0.30
1 1/4 (Metro PCS)	A	Yes	Ar (CfAe)	177.00 - 6.50	0.0000	-0.15	6	6	1.5500	1.5500		0.66
7/8 (Mid Grid Dish)	C	Yes	Ar (CfAe)	172.00 - 6.50	0.0000	-0.25	1	1	1.1100	1.1100		0.54
7/8 (Omni)	C	Yes	Ar (CfAe)	130.00 - 6.50	0.0000	0.4	1	1	1.1100	1.1100		0.54
1/2 (Low Grid Dish)	C	Yes	Ar (CfAe)	150.00 - 6.50	0.0000	-0.4	1	1	0.5800	0.5800		0.25
*****												
3/8 (Detuner)	A	No	Ar (Leg)	170.00 - 6.50	0.0000	-0.5	1	1	0.3750	0.3750		0.26
3/8 (Detuner)	B	No	Ar (Leg)	170.00 - 6.50	0.0000	-0.5	1	1	0.3750	0.3750		0.26
3/8 (Detuner)	C	No	Ar (Leg)	170.00 - 6.50	0.0000	-0.5	1	1	0.3750	0.3750		0.26

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	250.00-200.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	0.000	0.000	0.00
T1	200.00-180.00	A	6.411	0.000	0.000	0.000	59.64
		B	10.690	0.000	0.000	0.000	46.00
		C	5.050	0.000	0.000	0.000	41.80
T2	180.00-160.00	A	32.117	0.000	0.000	0.000	240.32
		B	17.750	0.000	0.000	0.000	48.60
		C	6.785	0.000	0.000	0.000	50.88
T3	160.00-140.00	A	35.067	0.000	0.000	0.000	254.80
		B	18.375	0.000	0.000	0.000	51.20
		C	8.633	0.000	0.000	0.000	60.30
T4	140.00-120.00	A	35.067	0.000	0.000	0.000	254.80
		B	18.375	0.000	0.000	0.000	51.20
		C	10.304	0.000	0.000	0.000	71.35
T5	120.00-100.00	A	35.067	0.000	0.000	0.000	254.80
		B	18.375	0.000	0.000	0.000	51.20
		C	12.717	0.000	0.000	0.000	94.60
T6	100.00-80.00	A	35.067	0.000	0.000	0.000	254.80
		B	18.375	0.000	0.000	0.000	51.20
		C	12.717	0.000	0.000	0.000	94.60
T7	80.00-60.00	A	35.067	0.000	0.000	0.000	254.80
		B	18.375	0.000	0.000	0.000	51.20
		C	12.717	0.000	0.000	0.000	94.60
T8	60.00-40.00	A	35.067	0.000	0.000	0.000	254.80
		B	18.375	0.000	0.000	0.000	51.20
		C	12.717	0.000	0.000	0.000	94.60
T9	40.00-20.00	A	35.067	0.000	0.000	0.000	254.80
		B	18.375	0.000	0.000	0.000	51.20
		C	12.717	0.000	0.000	0.000	94.60
T10	20.00-6.50	A	23.670	0.000	0.000	0.000	171.99
		B	12.403	0.000	0.000	0.000	34.56
		C	8.584	0.000	0.000	0.000	63.85
T11	6.50-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	250.00-200.00	A	0.944	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	200.00-180.00	A	0.925	10.000	3.617	0.000	0.000	274.78
		B		23.182	0.000	0.000	0.000	206.78
		C		11.219	0.000	0.000	0.000	152.15
T2	180.00-160.00	A	0.913	36.819	32.292	0.000	0.000	1189.94
		B		39.054	0.000	0.000	0.000	220.79
		C		17.742	0.000	0.000	0.000	200.67
T3	160.00-140.00	A	0.899	40.968	36.167	0.000	0.000	1261.21
		B		42.360	0.000	0.000	0.000	233.78
		C		25.123	0.000	0.000	0.000	254.85
T4	140.00-120.00	A	0.884	40.560	36.167	0.000	0.000	1243.47
		B		41.952	0.000	0.000	0.000	229.35
		C		29.902	0.000	0.000	0.000	304.73
T5	120.00-100.00	A	0.867	40.092	36.167	0.000	0.000	1223.29
		B		41.484	0.000	0.000	0.000	224.33
		C		35.825	0.000	0.000	0.000	376.67

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T6	100.00-80.00	A	0.846	39.542	36.167	0.000	0.000	1199.76
		B		40.934	0.000	0.000	0.000	218.50
		C		35.276	0.000	0.000	0.000	366.97
T7	80.00-60.00	A	0.821	38.872	36.167	0.000	0.000	1171.37
		B		40.264	0.000	0.000	0.000	211.52
		C		34.605	0.000	0.000	0.000	355.35
T8	60.00-40.00	A	0.788	38.006	36.167	0.000	0.000	1135.13
		B		39.398	0.000	0.000	0.000	202.67
		C		33.739	0.000	0.000	0.000	340.65
T9	40.00-20.00	A	0.750	72.567	0.000	0.000	0.000	976.02
		B		38.375	0.000	0.000	0.000	192.49
		C		32.717	0.000	0.000	0.000	323.77
T10	20.00-6.50	A	0.750	48.983	0.000	0.000	0.000	658.81
		B		25.903	0.000	0.000	0.000	129.93
		C		22.084	0.000	0.000	0.000	218.54
T11	6.50-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
L1	250.00-200.00		0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
T1	200.00-180.00	A	0.175	1.254	0.037	0.086
		B	0.428	2.990	0.090	0.206
		C	0.354	2.418	0.063	0.140
T2	180.00-160.00	A	1.347	8.491	0.000	0.000
		B	0.451	2.992	0.000	0.000
		C	0.452	3.050	0.000	0.000
T3	160.00-140.00	A	1.492	9.238	0.000	0.000
		B	0.451	2.938	0.000	0.000
		C	0.541	3.836	0.000	0.000
T4	140.00-120.00	A	1.492	9.482	0.349	0.741
		B	0.451	2.996	0.105	0.234
		C	0.664	4.996	0.132	0.332
T5	120.00-100.00	A	1.492	8.958	0.000	0.000
		B	0.451	2.810	0.000	0.000
		C	0.841	6.031	0.000	0.000
T6	100.00-80.00	A	1.492	8.784	0.000	0.000
		B	0.451	2.730	0.000	0.000
		C	0.841	5.852	0.000	0.000
T7	80.00-60.00	A	1.492	8.917	0.349	0.732
		B	0.451	2.741	0.105	0.225
		C	0.841	5.829	0.167	0.407
T8	60.00-40.00	A	1.492	8.305	0.000	0.000
		B	0.451	2.515	0.000	0.000
		C	0.841	5.368	0.000	0.000
T9	40.00-20.00	A	1.492	7.896	0.000	0.000
		B	0.451	2.377	0.000	0.000
		C	0.841	5.058	0.000	0.000
T10	20.00-6.50	A	1.171	5.726	0.000	0.000
		B	0.354	1.724	0.000	0.000
		C	0.645	3.622	0.000	0.000

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T11	6.50-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	250.00-200.00	0.0000	0.0000	0.0000	0.0000
T1	200.00-180.00	2.4859	-0.9680	2.1785	-0.9694
T2	180.00-160.00	-0.3929	-3.6623	0.1715	-3.1072
T3	160.00-140.00	-0.5284	-3.3395	0.1389	-2.6781
T4	140.00-120.00	-0.5446	-3.0406	0.1246	-2.3933
T5	120.00-100.00	-0.5766	-2.7698	0.0747	-2.0933
T6	100.00-80.00	-0.5766	-2.7698	0.0543	-2.0982
T7	80.00-60.00	-0.5568	-2.7220	0.0391	-2.0941
T8	60.00-40.00	-0.5766	-2.7698	-0.0056	-2.1133
T9	40.00-20.00	-0.5766	-2.7698	-0.4853	-2.4959
T10	20.00-6.50	-0.5490	-2.6694	-0.4705	-2.4577
T11	6.50-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Lightning Rod 5/8x4' (tower)	C	None		0.0000	252.00	No Ice	0.25	0.25	31.00
						1/2" Ice	0.66	0.66	33.82
						1" Ice	0.97	0.97	39.29
						2" Ice	1.49	1.49	58.83
						4" Ice	2.68	2.68	136.56
Flash Beacon Lighting (tower)	B	None		0.0000	250.00	No Ice	2.70	2.70	50.00
						1/2" Ice	3.10	3.10	70.00
						1" Ice	3.50	3.50	90.00
						2" Ice	4.30	4.30	130.00
						4" Ice	5.90	5.90	210.00
******									
6810 ((4 Bay Array))	B	From Face	3.00 0.00 0.00	0.0000	237.50	No Ice	22.30	22.30	354.00
						1/2" Ice	40.14	40.14	460.20
						1" Ice	57.98	57.98	566.40
						2" Ice	93.66	93.66	778.80
						4" Ice	165.02	165.02	1203.60
6810-2 ((3 Bay Array))	B	From Face	3.00 0.00 0.00	0.0000	215.00	No Ice	10.80	10.80	247.00
						1/2" Ice	19.44	19.44	321.10
						1" Ice	28.08	28.08	395.20
						2" Ice	45.36	45.36	543.40
						4" Ice	79.92	79.92	839.80

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
******									
Pirod Delta Mount (3)	C	From Face	3.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.94 47.60 62.26 91.58 150.22	32.94 47.60 62.26 91.58 150.22	740.00 1000.00 1260.00 1780.00 2820.00
(2) DB844G65ZAXY w/Mount Pipe (Sprint CDMA)	A	From Face	3.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.38 6.07 6.65 7.83 10.34	5.40 6.49 7.30 8.96 12.49	41.55 92.81 150.42 288.32 688.90
(2) DB844G65ZAXY w/Mount Pipe (Sprint CDMA)	B	From Face	3.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.38 6.07 6.65 7.83 10.34	5.40 6.49 7.30 8.96 12.49	41.55 92.81 150.42 288.32 688.90
(2) DB980H90E-M w/Mount Pipe (Sprint CDMA)	C	From Face	3.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.27 4.86 5.37 6.42 8.86	3.86 4.95 5.75 7.39 10.87	34.05 72.67 117.82 231.39 585.55
APXVSPP18-C w/Mount Pipe (Sprint NV)	A	From Face	3.00 -2.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.56 9.21 9.83 11.10 13.75	6.95 8.13 9.03 10.85 14.86	82.55 150.82 227.06 407.06 911.21
APXVSPP18-C w/Mount Pipe (Sprint NV)	B	From Face	3.00 -2.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.56 9.21 9.83 11.10 13.75	6.95 8.13 9.03 10.85 14.86	82.55 150.82 227.06 407.06 911.21
P40-16XLPP-RR w/Mount Pipe (Sprint NV)	C	From Face	3.00 -2.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.32 9.80 10.29 11.29 13.40	4.68 5.31 5.96 7.41 10.63	81.03 142.30 210.28 369.19 804.78
1900MHz 4x40W RRH (Sprint NV)	A	From Leg	3.00 1.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.84 3.09 3.61 4.74	59.50 82.62 108.98 172.17 345.91
1900MHz 4x40W RRH (Sprint NV)	B	From Leg	3.00 1.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.84 3.09 3.61 4.74	59.50 82.62 108.98 172.17 345.91
1900MHz 4x40W RRH (Sprint NV)	C	From Leg	3.00 1.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.84 3.09 3.61 4.74	59.50 82.62 108.98 172.17 345.91
800MHz 2x50W RRH (Sprint NV)	A	From Leg	3.00 1.00 2.50	0.0000	187.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	64.00 86.12 111.30 171.62 337.52
800MHz 2x50W RRH	B	From Leg	3.00	0.0000	187.00	No Ice	2.40	2.25	64.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint NV)			1.00			1/2" Ice	2.61	2.46	86.12
			2.50			1" Ice	2.83	2.68	111.30
						2" Ice	3.30	3.13	171.62
						4" Ice	4.34	4.15	337.52
800MHz 2x50W RRH	C	From Leg	3.00	0.0000	187.00	No Ice	2.40	2.25	64.00
(Sprint NV)			1.00			1/2" Ice	2.61	2.46	86.12
			2.50			1" Ice	2.83	2.68	111.30
						2" Ice	3.30	3.13	171.62
						4" Ice	4.34	4.15	337.52
8'x2" Antenna Mount Pipe	A	From Leg	3.00	0.0000	187.00	No Ice	1.90	1.90	30.00
(Sprint NV)			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
						2" Ice	4.40	4.40	119.66
						4" Ice	6.50	6.50	301.15
8'x2" Antenna Mount Pipe	B	From Leg	3.00	0.0000	187.00	No Ice	1.90	1.90	30.00
(Sprint NV)			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
						2" Ice	4.40	4.40	119.66
						4" Ice	6.50	6.50	301.15
8'x2" Antenna Mount Pipe	C	From Leg	3.00	0.0000	187.00	No Ice	1.90	1.90	30.00
(Sprint NV)			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
						2" Ice	4.40	4.40	119.66
						4" Ice	6.50	6.50	301.15
****									
APXV9TM14-ALU-120 w/ 3.5" mount pipe	A	From Face	3.00	0.0000	187.00	No Ice	8.20	6.75	128.00
(Sprint 2.5)			2.00			1/2" Ice	8.85	7.59	201.91
			0.00			1" Ice	9.51	8.45	285.73
						2" Ice	10.87	10.26	471.85
						4" Ice	13.75	14.23	969.86
APXV9TM14-ALU-120 w/ 3.5" mount pipe	B	From Face	3.00	0.0000	187.00	No Ice	8.20	6.75	128.00
(Sprint 2.5)			2.00			1/2" Ice	8.85	7.59	201.91
			0.00			1" Ice	9.51	8.45	285.73
						2" Ice	10.87	10.26	471.85
						4" Ice	13.75	14.23	969.86
APXV9TM14-ALU-120 w/ 3.5" mount pipe	C	From Face	3.00	0.0000	187.00	No Ice	8.20	6.75	128.00
(Sprint 2.5)			2.00			1/2" Ice	8.85	7.59	201.91
			0.00			1" Ice	9.51	8.45	285.73
						2" Ice	10.87	10.26	471.85
						4" Ice	13.75	14.23	969.86
TD-RRH 8x20	A	From Leg	3.00	0.0000	187.00	No Ice	4.32	1.41	66.13
(Sprint 2.5)			-1.00			1/2" Ice	4.60	1.61	90.06
			0.00			1" Ice	4.89	1.83	117.33
						2" Ice	5.50	2.28	182.69
						4" Ice	6.82	3.30	362.08
TD-RRH 8x20	B	From Leg	3.00	0.0000	187.00	No Ice	4.32	1.41	66.13
(Sprint 2.5)			-1.00			1/2" Ice	4.60	1.61	90.06
			0.00			1" Ice	4.89	1.83	117.33
						2" Ice	5.50	2.28	182.69
						4" Ice	6.82	3.30	362.08
TD-RRH 8x20	C	From Leg	3.00	0.0000	187.00	No Ice	4.32	1.41	66.13
(Sprint 2.5)			-1.00			1/2" Ice	4.60	1.61	90.06
			0.00			1" Ice	4.89	1.83	117.33
						2" Ice	5.50	2.28	182.69
						4" Ice	6.82	3.30	362.08
******									
Sabre 12' T-Boom (1) (Ramaker)	A	From Leg	2.50	0.0000	177.00	No Ice	22.00	11.00	471.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	29.10	14.60	690.00
			0.00			1" Ice	36.20	18.20	909.00
						2" Ice	50.40	25.40	1347.00
						4" Ice	78.80	39.80	2223.00
Sabre 12' T-Boom (1) (Ramaker)	B	From Leg	2.50	0.0000	177.00	No Ice	22.00	11.00	471.00
			0.00			1/2" Ice	29.10	14.60	690.00
			0.00			1" Ice	36.20	18.20	909.00
						2" Ice	50.40	25.40	1347.00
						4" Ice	78.80	39.80	2223.00
Sabre 12' T-Boom (1) (Ramaker)	C	From Leg	2.50	0.0000	177.00	No Ice	22.00	11.00	471.00
			0.00			1/2" Ice	29.10	14.60	690.00
			0.00			1" Ice	36.20	18.20	909.00
						2" Ice	50.40	25.40	1347.00
						4" Ice	78.80	39.80	2223.00
742-351 w/ Mount Pipe (Metro-PCS)	A	From Leg	2.50	0.0000	177.00	No Ice	6.77	3.63	59.00
			-6.00			1/2" Ice	7.57	4.77	107.40
			0.00			1" Ice	8.30	5.76	162.35
						2" Ice	9.64	7.42	295.85
						4" Ice	12.46	10.93	694.77
742-351 w/ Mount Pipe (Metro-PCS)	B	From Leg	2.50	0.0000	177.00	No Ice	6.77	3.63	59.00
			-6.00			1/2" Ice	7.57	4.77	107.40
			0.00			1" Ice	8.30	5.76	162.35
						2" Ice	9.64	7.42	295.85
						4" Ice	12.46	10.93	694.77
742-351 w/ Mount Pipe (Metro-PCS)	C	From Leg	2.50	0.0000	177.00	No Ice	6.77	3.63	59.00
			-6.00			1/2" Ice	7.57	4.77	107.40
			0.00			1" Ice	8.30	5.76	162.35
						2" Ice	9.64	7.42	295.85
						4" Ice	12.46	10.93	694.77
******									
2' Standoff	C	From Leg	1.00	0.0000	130.00	No Ice	1.80	1.80	33.00
			0.00			1/2" Ice	3.30	3.30	59.00
			0.00			1" Ice	4.80	4.80	85.00
						2" Ice	7.80	7.80	137.00
						4" Ice	13.80	13.80	241.00
8' Omni	C	From Leg	2.00	0.0000	130.00	No Ice	2.40	2.40	30.00
			0.00			1/2" Ice	3.19	3.19	47.51
			4.00			1" Ice	3.67	3.67	70.37
						2" Ice	4.68	4.68	132.73
						4" Ice	6.79	6.79	328.31
******									
Small Beacon (tower)	A	From Leg	1.00	0.0000	123.00	No Ice	0.31	0.31	7.00
			0.00			1/2" Ice	0.40	0.40	11.00
			0.00			1" Ice	0.51	0.51	16.21
						2" Ice	0.75	0.75	30.93
						4" Ice	1.37	1.37	81.73
Small Beacon (tower)	B	From Leg	1.00	0.0000	123.00	No Ice	0.31	0.31	7.00
			0.00			1/2" Ice	0.40	0.40	11.00
			0.00			1" Ice	0.51	0.51	16.21
						2" Ice	0.75	0.75	30.93
						4" Ice	1.37	1.37	81.73
Small Beacon (tower)	C	From Leg	1.00	0.0000	123.00	No Ice	0.31	0.31	7.00
			0.00			1/2" Ice	0.40	0.40	11.00
			0.00			1" Ice	0.51	0.51	16.21
						2" Ice	0.75	0.75	30.93
						4" Ice	1.37	1.37	81.73
******									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
PR-950	B	Grid	From Leg	1.00 0.00 0.00	0.0000		199.00	4.65	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.00 17.61 18.22 19.44 21.88	38.00 91.75 145.50 253.00 468.00
PR-950	C	Grid	From Leg	1.00 0.00 0.00	0.0000		172.00	4.65	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.00 17.61 18.22 19.44 21.88	38.00 91.75 145.50 253.00 468.00
4' Grid Dish	C	Grid	From Leg	1.00 0.00 0.00	0.0000		150.00	4.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	12.57 13.10 13.62 14.68 16.80	100.00 167.22 234.44 368.88 637.76

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	9864.78			
Bracing Weight	4286.47			
Total Member Self-Weight	14151.25			
Guy Weight	1598.06			
Total Weight	24048.92			
Wind 0 deg - No Ice		23.40	-26563.29	2493.60
Wind 30 deg - No Ice		13287.07	-23009.49	1200.99
Wind 60 deg - No Ice		23024.10	-13297.25	255.58
Wind 90 deg - No Ice		26630.54	6.84	-837.42
Wind 120 deg - No Ice		23038.16	13297.96	-2229.41
Wind 150 deg - No Ice		13173.91	22956.77	-3098.45
Wind 180 deg - No Ice		-34.29	26531.36	-2498.43
Wind 210 deg - No Ice		-13261.73	23023.96	-1277.67
Wind 240 deg - No Ice		-23102.18	13361.94	-264.18
Wind 270 deg - No Ice		-26630.49	41.83	867.20
Wind 300 deg - No Ice		-22988.54	-13237.13	2242.86
Wind 330 deg - No Ice		-13242.47	-22917.28	3145.36
Member Ice	5778.29			
Guy Ice	3540.38			
Total Weight Ice	49815.41			
Wind 0 deg - Ice		103.14	-9930.04	1717.04
Wind 30 deg - Ice		5077.93	-8491.99	1335.19
Wind 60 deg - Ice		8627.00	-4970.68	382.33
Wind 90 deg - Ice		9936.76	-155.95	-696.51
Wind 120 deg - Ice		8709.94	4738.60	-1537.36

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 150 deg - Ice		4872.16	8455.07	-1813.36
Wind 180 deg - Ice		-13.21	9790.35	-1598.60
Wind 210 deg - Ice		-4896.85	8488.34	-970.36
Wind 240 deg - Ice		-8659.79	4828.74	-179.68
Wind 270 deg - Ice		-9900.00	-88.62	558.41
Wind 300 deg - Ice		-8570.27	-4922.67	1216.27
Wind 330 deg - Ice		-4984.77	-8455.80	1586.64
Total Weight	24048.92			
Wind 0 deg - Service		8.10	-9191.45	862.84
Wind 30 deg - Service		4597.60	-7961.76	415.57
Wind 60 deg - Service		7966.82	-4601.12	88.43
Wind 90 deg - Service		9214.72	2.37	-289.77
Wind 120 deg - Service		7971.68	4601.37	-771.42
Wind 150 deg - Service		4558.45	7943.52	-1072.13
Wind 180 deg - Service		-11.86	9180.40	-864.51
Wind 210 deg - Service		-4588.83	7966.77	-442.10
Wind 240 deg - Service		-7993.83	4623.51	-91.41
Wind 270 deg - Service		-9214.70	14.48	300.07
Wind 300 deg - Service		-7954.51	-4580.32	776.07
Wind 330 deg - Service		-4582.17	-7929.86	1088.36

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy
5	Dead+Wind 90 deg - No Ice+Guy
6	Dead+Wind 120 deg - No Ice+Guy
7	Dead+Wind 150 deg - No Ice+Guy
8	Dead+Wind 180 deg - No Ice+Guy
9	Dead+Wind 210 deg - No Ice+Guy
10	Dead+Wind 240 deg - No Ice+Guy
11	Dead+Wind 270 deg - No Ice+Guy
12	Dead+Wind 300 deg - No Ice+Guy
13	Dead+Wind 330 deg - No Ice+Guy
14	Dead+Ice+Temp+Guy
15	Dead+Wind 0 deg+Ice+Temp+Guy
16	Dead+Wind 30 deg+Ice+Temp+Guy
17	Dead+Wind 60 deg+Ice+Temp+Guy
18	Dead+Wind 90 deg+Ice+Temp+Guy
19	Dead+Wind 120 deg+Ice+Temp+Guy
20	Dead+Wind 150 deg+Ice+Temp+Guy
21	Dead+Wind 180 deg+Ice+Temp+Guy
22	Dead+Wind 210 deg+Ice+Temp+Guy
23	Dead+Wind 240 deg+Ice+Temp+Guy
24	Dead+Wind 270 deg+Ice+Temp+Guy
25	Dead+Wind 300 deg+Ice+Temp+Guy
26	Dead+Wind 330 deg+Ice+Temp+Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy

Comb. No.	Description
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	250 - 200	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-5133.01	-3013.00	1688.87
			Max. Mx	5	-3913.50	-74132.97	799.13
			Max. My	2	-3910.02	-2671.08	73467.89
			Max. Vy	5	2481.12	-74132.97	799.13
			Max. Vx	2	-2486.31	-2671.08	73467.89
			Max. Torque	7			4253.21
T1	200 - 180	Leg	Max Tension	8	41166.58	-143.95	-308.49
			Max. Compression	6	-45131.25	189.35	9.02
			Max. Mx	22	-9888.30	-2581.68	1421.30
			Max. My	17	-7817.79	69.59	-2901.11
			Max. Vy	22	-11454.11	281.81	-168.53
			Max. Vx	17	-13004.84	-3.77	350.07
		Diagonal	Max Tension	3	6523.99	0.00	0.00
			Max. Compression	9	-6720.38	0.00	0.00
			Max. Mx	20	2336.55	8.08	0.00
			Max. My	2	2519.94	0.00	-0.09
			Max. Vy	20	-7.31	0.00	0.00
			Max. Vx	2	0.08	0.00	0.00
		Horizontal	Max Tension	6	781.70	0.00	0.00
			Max. Compression	6	-781.70	0.00	0.00
			Max. Mx	14	195.32	4.59	0.00
			Max. My	2	775.44	0.00	-0.00
			Max. Vy	14	6.12	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	5	0.03	-0.54	-0.02
			Max. Compression	11	-0.03	-0.60	-0.02
			Max. Mx	2	0.00	1.83	0.03
			Max. My	2	0.00	1.80	0.03
			Max. Vy	18	3.83	-1.16	-0.00
			Max. Vx	2	-0.02	0.00	0.00
		Top Girt	Max Tension	26	7817.40	0.00	0.00
			Max. Compression	7	-973.25	0.00	0.00
			Max. Mx	23	7502.52	-14.41	0.00
			Max. My	2	12.89	0.00	0.00
			Max. Vy	23	19.21	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1904.42	0.00	0.00
			Max. Compression	2	-1775.13	0.00	0.00
			Max. Mx	14	34.15	4.59	0.00
			Max. My	2	-1775.06	0.00	-0.00
			Max. Vy	14	6.12	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Guy A	Bottom Tension	9	13820.68		
			Top Tension	9	13944.36		
			Top Cable Vert	9	10712.09		
			Top Cable Norm	9	8927.22		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Tan	9	32.48		
			Bot Cable Vert	9	-10413.78		
			Bot Cable Norm	9	9085.54		
			Bot Cable Tan	9	131.55		
		Guy B	Bottom Tension	11	13596.71		
			Top Tension	11	13720.40		
			Top Cable Vert	11	10542.30		
			Top Cable Norm	11	8781.14		
			Top Cable Tan	11	31.69		
			Bot Cable Vert	11	-10243.98		
			Bot Cable Norm	11	8939.46		
			Bot Cable Tan	11	132.34		
		Guy C	Bottom Tension	3	13809.88		
			Top Tension	3	13933.57		
			Top Cable Vert	3	10703.91		
			Top Cable Norm	3	8920.18		
			Top Cable Tan	3	32.28		
			Bot Cable Vert	3	-10405.60		
			Bot Cable Norm	3	9078.49		
			Bot Cable Tan	3	131.75		
		Top Guy Pull-Off	Max Tension	5	7734.53	0.00	0.00
			Max. Compression	11	-7646.19	0.00	0.00
			Max. Mx	14	39.54	5.46	0.00
			Max. My	2	4881.13	0.00	-0.00
			Max. Vy	14	-7.27	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Torque Arm Top	Max Tension	7	9709.12	0.00	0.00
			Max. Compression	7	-4518.33	0.00	0.00
			Max. Mx	7	322.87	-32242.04	0.00
			Max. My	2	-3538.22	-25990.90	0.00
			Max. Vy	7	10778.41	-32242.04	0.00
			Max. Vx	2	0.00	-25990.90	0.00
T2	180 - 160	Leg	Max Tension	8	8911.10	35.76	-81.69
			Max. Compression	6	-36822.47	171.81	308.72
			Max. Mx	4	-20300.78	454.52	-249.86
			Max. My	8	8906.98	-136.23	382.85
			Max. Vy	4	-1835.58	-4.08	64.57
			Max. Vx	8	-1858.81	35.76	-81.69
		Diagonal	Max Tension	9	5859.31	0.00	0.00
			Max. Compression	3	-6121.61	0.00	0.00
			Max. Mx	21	-1136.29	7.99	0.00
			Max. My	2	984.96	0.00	-0.07
			Max. Vy	21	-7.23	0.00	0.00
			Max. Vx	2	0.06	0.00	0.00
		Horizontal	Max Tension	4	1279.37	0.00	0.00
			Max. Compression	10	-1092.03	0.00	0.00
			Max. Mx	14	234.40	4.55	0.00
			Max. My	2	598.99	0.00	0.00
			Max. Vy	14	-6.06	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	6	0.02	-0.15	-0.01
			Max. Compression	10	-0.02	-0.28	-0.01
			Max. Mx	18	0.01	-1.15	-0.00
			Max. My	2	0.00	0.90	0.02
			Max. Vy	18	3.80	-1.15	-0.00
			Max. Vx	2	-0.01	0.00	0.00
		Top Girt	Max Tension	2	1633.06	0.00	0.00
			Max. Compression	8	-1613.53	0.00	0.00
			Max. Mx	14	38.78	4.55	0.00
			Max. My	2	1633.06	0.00	-0.00
			Max. Vy	14	-6.06	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	2	0.00	0.00	0.00
		Bottom Girt	Max Tension	9	499.45	0.00	0.00
			Max. Compression	4	-409.50	0.00	0.00
			Max. Mx	14	36.80	4.55	0.00
			Max. My	7	91.45	0.00	0.00
			Max. Vy	14	-6.06	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	8	1544.63	66.37	153.54
			Max. Compression	6	-36393.92	-70.92	81.97
			Max. Mx	10	-32397.41	-296.75	-81.36
			Max. My	8	-19634.30	-41.18	274.32
			Max. Vy	11	-1055.79	-22.14	-92.38
			Max. Vx	2	-1015.45	-14.86	92.32
		Diagonal	Max Tension	5	2627.59	0.00	0.00
			Max. Compression	10	-2998.87	0.00	0.00
			Max. Mx	21	102.44	7.91	0.00
			Max. My	6	-346.75	0.00	0.06
			Max. Vy	21	-7.15	0.00	0.00
			Max. Vx	6	-0.05	0.00	0.00
		Horizontal	Max Tension	6	630.36	0.00	0.00
			Max. Compression	6	-630.36	0.00	0.00
			Max. Mx	14	271.77	4.50	0.00
			Max. My	13	546.53	0.00	0.00
			Max. Vy	14	5.99	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	6	0.02	-0.23	-0.01
			Max. Compression	10	-0.02	-0.35	-0.01
			Max. Mx	18	0.01	-1.14	-0.00
			Max. My	2	0.00	0.60	0.01
			Max. Vy	18	3.76	-1.14	-0.00
			Max. Vx	2	-0.01	0.00	0.00
		Top Girt	Max Tension	3	460.49	0.00	0.00
			Max. Compression	10	-360.62	0.00	0.00
			Max. Mx	14	48.86	4.50	0.00
			Max. My	7	-120.37	0.00	0.00
			Max. Vy	14	5.99	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
		Bottom Girt	Max Tension	10	963.37	0.00	0.00
			Max. Compression	4	-764.72	0.00	0.00
			Max. Mx	14	38.47	4.50	0.00
			Max. My	6	-303.16	0.00	-0.00
			Max. Vy	14	5.99	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T4	140 - 120	Leg	Max Tension	8	12601.55	46.93	-106.01
			Max. Compression	6	-48716.92	-162.71	76.76
			Max. Mx	10	-10348.39	381.97	-247.27
			Max. My	2	-8168.84	37.93	386.32
			Max. Vy	5	-1168.70	-368.42	-32.11
			Max. Vx	2	1223.93	46.47	334.48
		Diagonal	Max Tension	3	3698.45	0.00	0.00
			Max. Compression	9	-4015.69	0.00	0.00
			Max. Mx	25	628.07	7.82	0.00
			Max. My	6	-262.99	0.00	0.05
			Max. Vy	25	-7.07	0.00	0.00
			Max. Vx	6	-0.05	0.00	0.00
		Horizontal	Max Tension	5	1626.70	0.00	0.00
			Max. Compression	6	-843.80	0.00	0.00
			Max. Mx	14	711.32	4.44	0.00
			Max. My	13	743.72	0.00	0.00
			Max. Vy	14	5.92	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Secondary Horizontal	Max Tension	6	0.02	-0.32	-0.01
			Max. Compression	10	-0.02	-0.43	-0.01
			Max. Mx	19	0.00	-1.13	-0.00
			Max. My	2	0.00	0.28	0.01
			Max. Vy	19	3.71	-1.13	-0.00
			Max. Vx	2	-0.01	0.00	0.00
		Top Girt	Max Tension	4	946.14	0.00	0.00
			Max. Compression	10	-969.02	0.00	0.00
			Max. Mx	14	53.15	4.44	0.00
			Max. My	6	-660.27	0.00	0.00
			Max. Vy	14	5.92	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1135.20	0.00	0.00
			Max. Compression	6	-1149.69	0.00	0.00
			Max. Mx	14	62.80	4.44	0.00
			Max. My	6	-1149.65	0.00	0.00
			Max. Vy	14	5.92	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Guy A	Bottom Tension	9	11200.07		
			Top Tension	9	11284.45		
			Top Cable Vert	9	7125.10		
			Top Cable Norm	9	8750.49		
			Top Cable Tan	9	26.35		
			Bot Cable Vert	9	-6901.08		
			Bot Cable Norm	9	8821.03		
			Bot Cable Tan	9	77.88		
		Guy B	Bottom Tension	11	11253.00		
			Top Tension	11	11337.38		
			Top Cable Vert	11	7158.03		
			Top Cable Norm	11	8791.93		
			Top Cable Tan	11	26.82		
			Bot Cable Vert	11	-6934.01		
			Bot Cable Norm	11	8862.48		
			Bot Cable Tan	11	77.41		
		Guy C	Bottom Tension	3	11231.35		
			Top Tension	3	11315.73		
			Top Cable Vert	3	7144.56		
			Top Cable Norm	3	8774.98		
			Top Cable Tan	3	26.25		
			Bot Cable Vert	3	-6920.54		
			Bot Cable Norm	3	8845.53		
			Bot Cable Tan	3	77.98		
		Top Guy Pull-Off	Max Tension	5	3550.58	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1552.59	9.10	0.00
			Max. My	6	2802.94	0.00	0.00
			Max. Vy	14	12.13	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
T5	120 - 100	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-42179.57	127.04	315.69
			Max. Mx	4	-24021.30	337.50	-166.50
			Max. My	7	-37420.23	77.71	346.49
			Max. Vy	5	-1168.64	-76.32	-57.68
			Max. Vx	2	1224.47	129.28	28.65
		Diagonal	Max Tension	9	3338.34	0.00	0.00
			Max. Compression	3	-3674.19	0.00	0.00
			Max. Mx	17	-1422.99	7.72	0.00
			Max. My	6	-430.25	0.00	0.04
			Max. Vy	17	-6.98	0.00	0.00
			Max. Vx	6	-0.04	0.00	0.00
		Horizontal	Max Tension	6	730.57	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	6	-730.57	0.00	0.00
			Max. Mx	14	357.70	4.38	0.00
			Max. My	11	639.59	0.00	-0.00
			Max. Vy	14	-5.84	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	6	0.01	-0.45	-0.00
			Max. Compression	10	-0.01	-0.50	-0.00
			Max. Mx	19	0.00	-1.12	0.00
			Max. My	2	0.00	-0.12	0.00
			Max. Vy	19	3.66	-1.12	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	6	1134.59	0.00	0.00
			Max. Compression	8	-919.21	0.00	0.00
			Max. Mx	14	48.36	4.38	0.00
			Max. My	6	-286.65	0.00	-0.00
			Max. Vy	14	-5.84	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	555.32	0.00	0.00
			Max. Compression	2	-478.75	0.00	0.00
			Max. Mx	14	69.15	4.38	0.00
			Max. My	11	-237.01	0.00	-0.00
			Max. Vy	14	-5.84	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T6	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-25656.74	33.21	180.92
			Max. Mx	5	-16555.83	195.42	-14.73
			Max. My	2	-19177.67	-56.00	-183.76
			Max. Vy	10	478.47	110.93	-9.69
			Max. Vx	2	525.46	109.56	7.41
		Diagonal	Max Tension	9	1222.05	0.00	0.00
			Max. Compression	3	-1570.12	0.00	0.00
			Max. Mx	26	191.20	7.61	0.00
			Max. My	11	146.17	0.00	-0.04
			Max. Vy	26	6.88	0.00	0.00
			Max. Vx	11	0.03	0.00	0.00
		Horizontal	Max Tension	6	444.39	0.00	0.00
			Max. Compression	6	-444.39	0.00	0.00
			Max. Mx	14	377.91	4.30	0.00
			Max. My	11	406.26	0.00	-0.00
			Max. Vy	14	-5.74	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	6	0.01	-0.48	-0.00
			Max. Compression	10	-0.01	-0.53	-0.00
			Max. Mx	19	0.00	-1.09	-0.00
			Max. My	2	0.00	-0.27	0.00
			Max. Vy	19	3.59	-1.09	-0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	2	486.45	0.00	0.00
			Max. Compression	8	-335.05	0.00	0.00
			Max. Mx	14	50.91	4.30	0.00
			Max. My	11	272.37	0.00	-0.00
			Max. Vy	14	-5.74	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	216.02	0.00	0.00
			Max. Compression	12	-142.63	0.00	0.00
			Max. Mx	14	72.15	4.30	0.00
			Max. My	11	164.10	0.00	-0.00
			Max. Vy	14	-5.74	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-27402.54	126.99	0.51

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	5	-23994.87	-306.70	-110.93
			Max. My	2	-24167.61	-18.64	303.52
			Max. Vy	11	995.47	193.66	-85.03
			Max. Vx	2	871.65	65.97	220.51
		Diagonal	Max Tension	11	2511.21	0.00	0.00
			Max. Compression	5	-2878.65	0.00	0.00
			Max. Mx	16	241.63	7.47	0.00
			Max. My	11	438.35	0.00	-0.04
			Max. Vy	16	-6.76	0.00	0.00
			Max. Vx	11	0.03	0.00	0.00
		Horizontal	Max Tension	5	1040.84	0.00	0.00
			Max. Compression	21	-474.63	0.00	0.00
			Max. Mx	14	578.87	4.22	0.00
			Max. My	11	441.91	0.00	-0.00
			Max. Vy	14	-5.62	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	6	0.01	-0.49	-0.00
			Max. Compression	10	-0.01	-0.56	-0.00
			Max. Mx	18	0.00	-1.07	-0.00
			Max. My	2	0.00	-0.33	0.00
			Max. Vy	18	3.52	-1.07	-0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	12	369.60	0.00	0.00
			Max. Compression	7	-190.67	0.00	0.00
			Max. Mx	14	53.13	4.22	0.00
			Max. My	11	-123.82	0.00	-0.00
			Max. Vy	14	-5.62	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	838.26	0.00	0.00
			Max. Compression	2	-729.00	0.00	0.00
			Max. Mx	14	77.76	4.22	0.00
			Max. My	11	-635.94	0.00	-0.00
			Max. Vy	14	-5.62	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Guy A	Bottom Tension	8	6005.58		
			Top Tension	8	6032.13		
			Top Cable Vert	8	2379.84		
			Top Cable Norm	8	5542.83		
			Top Cable Tan	8	0.10		
			Bot Cable Vert	8	-2289.77		
			Bot Cable Norm	8	5551.94		
			Bot Cable Tan	8	0.10		
		Guy B	Bottom Tension	12	6017.68		
			Top Tension	12	6044.23		
			Top Cable Vert	12	2384.53		
			Top Cable Norm	12	5553.99		
			Top Cable Tan	12	0.29		
			Bot Cable Vert	12	-2294.46		
			Bot Cable Norm	12	5563.09		
			Bot Cable Tan	12	0.29		
		Guy C	Bottom Tension	4	6025.66		
			Top Tension	4	6052.21		
			Top Cable Vert	4	2387.62		
			Top Cable Norm	4	5561.34		
			Top Cable Tan	4	0.42		
			Bot Cable Vert	4	-2297.54		
			Bot Cable Norm	4	5570.45		
			Bot Cable Tan	4	0.42		
		Top Guy Pull-Off	Max Tension	5	2271.83	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1263.50	8.73	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	11	2135.90	0.00	-0.00
			Max. Vy	14	-11.64	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	7	-33660.51	131.76	3.42
			Max. Mx	11	-21502.17	-303.32	-106.86
			Max. My	7	-19525.27	67.38	271.15
			Max. Vy	5	-996.21	-58.12	-95.97
			Max. Vx	2	870.68	113.69	2.73
		Diagonal	Max Tension	5	2266.95	0.00	0.00
			Max. Compression	11	-2645.13	0.00	0.00
			Max. Mx	26	-338.62	7.31	0.00
			Max. My	10	74.96	0.00	-0.04
			Max. Vy	26	-6.61	0.00	0.00
			Max. Vx	10	0.03	0.00	0.00
		Horizontal	Max Tension	7	583.02	0.00	0.00
			Max. Compression	7	-583.02	0.00	0.00
			Max. Mx	14	439.67	4.10	0.00
			Max. My	11	582.68	0.00	-0.00
			Max. Vy	14	5.47	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	5	0.01	-0.56	-0.00
			Max. Compression	10	-0.01	-0.60	-0.00
			Max. Mx	18	0.01	-1.04	-0.00
			Max. My	2	0.00	-0.45	0.00
			Max. Vy	18	3.43	-1.04	-0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	2	749.28	0.00	0.00
			Max. Compression	8	-615.35	0.00	0.00
			Max. Mx	14	57.15	4.10	0.00
			Max. My	11	682.08	0.00	-0.00
			Max. Vy	14	5.47	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	393.98	0.00	0.00
			Max. Compression	11	-266.54	0.00	0.00
			Max. Mx	14	83.25	4.10	0.00
			Max. My	11	-266.51	0.00	-0.00
			Max. Vy	14	5.47	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-34786.50	82.82	145.24
			Max. Mx	5	-21594.55	215.90	-45.39
			Max. My	7	-13079.69	-14.09	190.93
			Max. Vy	5	441.25	105.78	-7.47
			Max. Vx	7	435.36	-50.37	82.20
		Diagonal	Max Tension	12	1075.37	0.00	0.00
			Max. Compression	6	-1389.80	0.00	0.00
			Max. Mx	22	206.38	7.11	0.00
			Max. My	10	238.51	0.00	-0.04
			Max. Vy	22	6.43	0.00	0.00
			Max. Vx	10	0.04	0.00	0.00
		Horizontal	Max Tension	5	602.52	0.00	0.00
			Max. Compression	5	-602.52	0.00	0.00
			Max. Mx	17	421.16	3.98	0.00
			Max. My	11	601.43	0.00	-0.00
			Max. Vy	17	-5.30	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	5	0.01	-0.56	-0.00
			Max. Compression	11	-0.01	-0.61	-0.00
			Max. Mx	17	0.01	-1.01	-0.00
			Max. My	2	0.00	-0.52	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	17	3.32	-1.01	-0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	11	321.65	0.00	0.00
			Max. Compression	5	-194.27	0.00	0.00
			Max. Mx	14	58.62	3.98	0.00
			Max. My	11	321.65	0.00	-0.00
			Max. Vy	14	-5.30	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Bottom Girt	Max Tension	6	408.73	0.00	0.00
			Max. Compression	12	-315.25	0.00	0.00
			Max. Mx	14	89.94	3.98	0.00
			Max. My	5	60.77	0.00	-0.00
			Max. Vy	14	-5.30	0.00	0.00
			Max. Vx	5	0.00	0.00	0.00
T10	20 - 6.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	11	-33211.79	-16.84	218.57
			Max. Mx	17	-29632.41	-815.50	365.64
			Max. My	21	-29814.20	88.72	-895.77
			Max. Vy	17	3395.14	-815.50	365.64
			Max. Vx	21	3960.58	88.72	-895.77
		Diagonal	Max Tension	12	2047.80	0.00	0.00
			Max. Compression	6	-2309.21	0.00	0.00
			Max. Mx	22	657.42	10.00	0.00
			Max. My	10	431.65	0.00	-0.06
			Max. Vy	22	-9.04	0.00	0.00
			Max. Vx	10	0.06	0.00	0.00
		Horizontal	Max Tension	11	575.25	0.00	0.00
			Max. Compression	11	-575.25	0.00	0.00
			Max. Mx	17	460.59	3.98	0.00
			Max. My	11	575.25	0.00	-0.00
			Max. Vy	17	-5.30	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	5	0.01	-0.56	-0.01
			Max. Compression	11	-0.01	-0.60	-0.01
			Max. Mx	17	0.01	-1.01	-0.00
			Max. My	2	0.00	-0.57	0.01
			Max. Vy	17	3.32	-1.01	-0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	12	570.68	0.00	0.00
			Max. Compression	6	-377.58	0.00	0.00
			Max. Mx	14	76.75	3.98	0.00
			Max. My	11	24.57	0.00	-0.00
			Max. Vy	14	-5.30	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Bottom Girt	Max Tension	6	2448.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	2112.37	3.98	0.00
			Max. My	11	2037.20	0.00	-0.00
			Max. Vy	17	-5.30	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T11	6.5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-30500.63	64.56	-33.42
			Max. Mx	21	-29962.95	895.77	85.84
			Max. My	11	-23984.40	-35.16	755.04
			Max. Vy	19	2630.18	-711.84	-20.48
			Max. Vx	11	-1255.74	-102.44	438.36
		Horizontal	Max Tension	21	537.85	192.44	0.99
			Max. Compression	21	-537.85	-352.84	-1.52
			Max. Mx	12	458.00	-1104.78	-17.92
			Max. My	11	496.12	-346.03	-20.53
			Max. Vy	12	-1416.20	-1104.78	-17.92

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	11	-29.68	-346.03	-20.53
		Top Girt	Max Tension	18	1649.66	-334.30	1.79
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	11	1416.52	-949.94	-19.62
			Max. My	11	1416.52	-949.94	-19.62
			Max. Vy	12	-448.93	-907.59	-17.02
			Max. Vx	11	-15.08	-949.94	-19.62
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-257.08	-73.57	-2.24
			Max. Mx	12	-214.84	-1165.82	4.22
			Max. My	5	-127.63	951.58	-6.36
			Max. Vy	12	-2774.45	-1165.82	4.22
			Max. Vx	5	-17.60	951.58	-6.36
		Base Beam	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-6102.38	-52.53	28.73
			Max. Mx	21	-28269.46	-8213.22	68.67
			Max. My	11	-23487.74	-6882.67	-555.65
			Max. Vy	21	-28269.46	-8213.22	68.67
			Max. Vx	11	-1307.48	-6882.67	-555.65

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Guy C @ 160 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-671.37	-477.08	275.53
	Max. H_x	10	-671.37	-477.08	275.53
	Max. H_z	3	-29439.48	-27557.35	16319.10
	Min. Vert	5	-29534.51	-27966.37	15728.16
	Min. H_x	5	-29534.51	-27966.37	15728.16
	Min. H_z	10	-671.37	-477.08	275.53
Guy B @ 160 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-670.65	478.20	276.00
	Max. H_x	11	-29509.73	27966.73	15728.49
	Max. H_z	13	-29354.02	27451.86	16273.53
	Min. Vert	11	-29509.73	27966.73	15728.49
	Min. H_x	6	-670.65	478.20	276.00
	Min. H_z	6	-670.65	478.20	276.00
Guy A @ 160 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-673.63	0.15	-553.47
	Max. H_x	11	-15564.68	694.22	-16797.40
	Max. H_z	2	-673.63	0.15	-553.47
	Min. Vert	9	-29426.04	353.43	-32000.49
	Min. H_x	5	-15553.90	-694.13	-16755.87
	Min. H_z	9	-29426.04	353.43	-32000.49
Mast	Max. Vert	17	83255.39	-545.07	254.72
	Max. H_x	11	70614.95	1490.46	73.50
	Max. H_z	2	74635.78	-3.39	1439.09
	Max. M_x	1	0.00	0.68	11.75
	Max. M_z	1	0.00	0.68	11.75
	Max. Torsion	5	1193.24	-1495.02	63.68
	Min. Vert	1	48634.05	0.68	11.75
	Min. H_x	5	70628.84	-1495.02	63.68

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_z	8	62302.58	-29.97	-1655.39
	Min. M_x	1	0.00	0.68	11.75
	Min. M_z	1	0.00	0.68	11.75
	Min. Torsion	11	-1200.60	1490.46	73.50

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	48634.05	-0.68	-11.75	0.00	0.00	5.89
Dead+Wind 0 deg - No Ice+Guy	74635.78	3.39	-1439.09	0.00	0.00	36.72
Dead+Wind 30 deg - No Ice+Guy	70471.80	828.25	-1221.96	0.00	0.00	-514.88
Dead+Wind 60 deg - No Ice+Guy	62325.81	1430.81	-782.16	0.00	0.00	-925.27
Dead+Wind 90 deg - No Ice+Guy	70628.84	1495.02	-63.68	0.00	0.00	-1193.24
Dead+Wind 120 deg - No Ice+Guy	74750.44	1259.56	743.52	0.00	0.00	-1020.55
Dead+Wind 150 deg - No Ice+Guy	70316.49	672.58	1355.45	0.00	0.00	-619.54
Dead+Wind 180 deg - No Ice+Guy	62302.58	29.97	1655.39	0.00	0.00	-175.87
Dead+Wind 210 deg - No Ice+Guy	70412.61	-658.03	1347.50	0.00	0.00	492.10
Dead+Wind 240 deg - No Ice+Guy	74831.75	-1245.74	732.22	0.00	0.00	977.03
Dead+Wind 270 deg - No Ice+Guy	70614.95	-1490.46	-73.50	0.00	0.00	1200.60
Dead+Wind 300 deg - No Ice+Guy	62283.99	-1406.02	-834.73	0.00	0.00	1088.29
Dead+Wind 330 deg - No Ice+Guy	70362.46	-822.81	-1236.80	0.00	0.00	620.06
Dead+Ice+Temp+Guy	81352.91	-55.10	43.55	0.00	0.00	0.39
Dead+Wind 0 deg+Ice+Temp+Guy	82930.43	-2.66	-613.98	0.00	0.00	227.37
Dead+Wind 30 deg+Ice+Temp+Guy	83044.96	311.22	-517.27	0.00	0.00	75.44
Dead+Wind 60 deg+Ice+Temp+Guy	83255.39	545.07	-254.72	0.00	0.00	-257.47
Dead+Wind 90 deg+Ice+Temp+Guy	83040.27	654.14	76.47	0.00	0.00	-528.10
Dead+Wind 120 deg+Ice+Temp+Guy	82901.07	580.85	395.45	0.00	0.00	-526.51
Dead+Wind 150 deg+Ice+Temp+Guy	82991.08	351.75	608.16	0.00	0.00	-352.09
Dead+Wind 180 deg+Ice+Temp+Guy	83203.75	13.51	675.55	0.00	0.00	-202.40
Dead+Wind 210 deg+Ice+Temp+Guy	82999.95	-323.94	598.95	0.00	0.00	-1.96
Dead+Wind 240 deg+Ice+Temp+Guy	82898.80	-566.48	381.09	0.00	0.00	278.67
Dead+Wind 270 deg+Ice+Temp+Guy	83031.83	-634.45	62.88	0.00	0.00	464.88
Dead+Wind 300 deg+Ice+Temp+Guy	83239.40	-531.98	-266.38	0.00	0.00	440.04
Dead+Wind 330 deg+Ice+Temp+Guy	83023.62	-303.04	-524.52	0.00	0.00	301.77
Dead+Wind 0 deg - Service+Guy	49135.87	1.40	-612.42	0.00	0.00	-8.11
Dead+Wind 30 deg - Service+Guy	49417.15	302.01	-516.57	0.00	0.00	-204.61
Dead+Wind 60 deg - Service+Guy	49617.15	519.19	-282.72	0.00	0.00	-360.84
Dead+Wind 90 deg - Service+Guy	49421.95	612.09	21.27	0.00	0.00	-426.80
Dead+Wind 120 deg - Service+Guy	49130.94	544.59	328.63	0.00	0.00	-359.23
Dead+Wind 150 deg - Service+Guy	49412.86	314.51	541.94	0.00	0.00	-206.51
Dead+Wind 180 deg - Service+Guy	49615.20	3.39	612.01	0.00	0.00	-5.25
Dead+Wind 210 deg - Service+Guy	49414.25	-307.94	538.75	0.00	0.00	193.01
Dead+Wind 240 deg - Service+Guy	49136.49	-538.45	324.35	0.00	0.00	359.20
Dead+Wind 270 deg - Service+Guy	49415.88	-608.57	17.66	0.00	0.00	425.06
Dead+Wind 300 deg - Service+Guy	49610.72	-516.44	-287.74	0.00	0.00	357.97
Dead+Wind 330 deg - Service+Guy	49409.77	-299.24	-521.27	0.00	0.00	203.33

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-24048.79	0.00	2.18	24048.79	25.40	0.106%
2	23.40	-24186.22	-28931.95	-23.56	24187.55	28977.02	0.120%
3	14468.77	-24048.76	-25056.24	-14459.00	24049.35	25084.43	0.079%
4	25075.41	-23911.31	-14481.57	-25086.53	23911.29	14461.67	0.061%
5	28993.93	-24048.76	6.84	-29026.81	24049.73	-46.11	0.136%
6	25089.48	-24186.22	14482.29	-25131.32	24187.63	-14506.71	0.128%
7	14355.60	-24048.76	25003.53	-14386.68	24049.37	-25009.17	0.084%
8	-34.28	-23911.31	28900.01	9.11	23911.30	-28899.82	0.067%
9	-14443.43	-24048.76	25070.72	14472.67	24049.35	-25076.36	0.079%
10	-25153.50	-24186.22	14546.27	25192.43	24187.56	-14569.13	0.119%
11	-28993.88	-24048.76	41.83	29024.79	24049.68	-78.71	0.128%
12	-25039.86	-23911.31	-14421.46	25027.45	23911.32	14443.16	0.067%
13	-14424.16	-24048.76	-24964.04	14413.92	24049.35	24992.53	0.081%
14	0.00	-49815.03	0.00	63.72	49815.03	6.25	0.129%
15	103.14	-49924.45	-11800.31	-103.11	49924.40	11798.56	0.003%
16	6010.89	-49815.03	-10107.93	-6007.84	49815.01	10108.48	0.006%
17	10246.71	-49705.61	-5905.81	-10240.16	49705.52	5898.69	0.019%
18	11802.68	-49815.03	-155.95	-11804.00	49815.04	150.54	0.011%
19	10329.65	-49924.45	5673.74	-10330.68	49924.44	-5674.46	0.002%
20	5805.12	-49815.03	10071.00	-5810.64	49815.04	-10069.64	0.011%
21	-13.21	-49705.61	11660.62	9.76	49705.52	-11651.67	0.019%
22	-5829.81	-49815.03	10104.27	5827.12	49814.93	-10098.38	0.013%
23	-10279.49	-49924.45	5763.88	10276.93	49924.39	-5762.60	0.006%
24	-11765.92	-49815.03	-88.62	11760.28	49814.94	86.77	0.012%
25	-10189.97	-49705.61	-5857.80	10181.87	49705.53	5854.35	0.017%
26	-5917.73	-49815.03	-10071.73	5914.53	49815.02	10073.62	0.007%
27	8.10	-24096.35	-10011.06	-8.08	24096.32	10007.96	0.012%
28	5006.49	-24048.79	-8669.98	-5005.02	24048.79	8671.53	0.008%
29	8676.61	-24001.22	-5010.93	-8673.35	24001.19	5007.74	0.018%
30	10032.50	-24048.79	2.37	-10033.92	24048.79	-5.47	0.013%
31	8681.48	-24096.35	5011.17	-8680.00	24096.33	-5010.34	0.007%
32	4967.34	-24048.79	8651.74	-4970.65	24048.79	-8651.49	0.013%
33	-11.86	-24001.22	10000.00	10.70	24001.19	-9995.70	0.017%
34	-4997.73	-24048.79	8674.99	4999.66	24048.79	-8674.55	0.008%
35	-8703.63	-24096.35	5033.31	8700.64	24096.31	-5031.64	0.013%
36	-10032.48	-24048.79	14.48	10033.27	24048.79	-16.62	0.009%
37	-8664.31	-24001.22	-4990.12	8660.74	24001.19	4988.42	0.015%
38	-4991.06	-24048.79	-8638.08	4989.58	24048.79	8640.09	0.010%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	12	0.00000001	0.00002646
2	Yes	23	0.00000001	0.00008120
3	Yes	23	0.00000001	0.00006472
4	Yes	18	0.00000001	0.00007168
5	Yes	22	0.00000001	0.00009894
6	Yes	23	0.00000001	0.00007787
7	Yes	23	0.00000001	0.00006952
8	Yes	18	0.00000001	0.00008295
9	Yes	23	0.00000001	0.00006541
10	Yes	23	0.00000001	0.00007060
11	Yes	22	0.00000001	0.00008764
12	Yes	16	0.00000001	0.00007956
13	Yes	23	0.00000001	0.00006556
14	Yes	20	0.00000001	0.00000000
15	Yes	16	0.00000001	0.00005850

16	Yes	16	0.00000001	0.00004753
17	Yes	15	0.00000001	0.00006210
18	Yes	16	0.00000001	0.00005087
19	Yes	16	0.00000001	0.00006122
20	Yes	16	0.00000001	0.00005813
21	Yes	15	0.00000001	0.00007281
22	Yes	15	0.00000001	0.00009739
23	Yes	16	0.00000001	0.00004601
24	Yes	15	0.00000001	0.00009400
25	Yes	15	0.00000001	0.00006759
26	Yes	16	0.00000001	0.00004810
27	Yes	14	0.00000001	0.00004252
28	Yes	14	0.00000001	0.00007591
29	Yes	13	0.00000001	0.00007145
30	Yes	14	0.00000001	0.00009359
31	Yes	14	0.00000001	0.00004895
32	Yes	14	0.00000001	0.00009756
33	Yes	13	0.00000001	0.00007471
34	Yes	14	0.00000001	0.00007404
35	Yes	14	0.00000001	0.00003962
36	Yes	14	0.00000001	0.00007022
37	Yes	13	0.00000001	0.00007062
38	Yes	14	0.00000001	0.00007813

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	250 - 200	8.964	29	0.6164	0.2504
T1	200 - 180	3.601	33	0.2279	0.2177
T2	180 - 160	2.834	29	0.1459	0.1286
T3	160 - 140	2.340	37	0.1152	0.1005
T4	140 - 120	1.903	37	0.0927	0.0942
T5	120 - 100	1.599	37	0.0491	0.1104
T6	100 - 80	1.454	35	0.0382	0.1276
T7	80 - 60	1.300	35	0.0468	0.1330
T8	60 - 40	1.110	35	0.0469	0.1273
T9	40 - 20	0.880	35	0.0726	0.1115
T10	20 - 6.5	0.499	35	0.1078	0.0864
T11	6.5 - 0	0.169	35	0.1200	0.0721

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
252.00	Lightning Rod 5/8x4'	29	8.964	0.6164	0.2569	40499
250.00	Flash Beacon Lighting	29	8.964	0.6164	0.2569	40499
237.50	6810	29	7.331	0.5060	0.2654	16200
215.00	6810-2	29	4.761	0.3234	0.2574	5785
199.00	PR-950	33	3.546	0.2226	0.2137	4380
187.00	Pirod Delta Mount (3)	33	3.040	0.1682	0.1582	10238
186.75	Guy	33	3.032	0.1672	0.1571	10540
177.00	Sabre 12' T-Boom (1) (Ramaker)	29	2.755	0.1386	0.1186	41779
172.00	PR-950	29	2.627	0.1291	0.1053	50216
150.00	4' Grid Dish	37	2.112	0.1066	0.0951	44889

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	2' Standoff	37	1.729	0.0706	0.1003	25905
126.75	Guy	37	1.682	0.0629	0.1025	24690
123.00	Small Beacon	37	1.633	0.0547	0.1068	23531
66.75	Guy	35	1.175	0.0459	0.1304	287205

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	250 - 200	39.359	6	2.0716	0.7862
T1	200 - 180	20.431	6	1.0451	0.8013
T2	180 - 160	16.571	6	0.8041	0.5369
T3	160 - 140	13.612	10	0.6968	0.3839
T4	140 - 120	10.931	10	0.5893	0.3219
T5	120 - 100	8.850	10	0.3995	0.3486
T6	100 - 80	7.444	10	0.3184	0.3676
T7	80 - 60	6.149	10	0.3086	0.3666
T8	60 - 40	4.903	10	0.2901	0.3517
T9	40 - 20	3.631	10	0.3476	0.3089
T10	20 - 6.5	1.976	10	0.4410	0.2396
T11	6.5 - 0	0.661	10	0.4743	0.1991

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
252.00	Lightning Rod 5/8x4'	6	39.359	2.0716	0.9146	15099
250.00	Flash Beacon Lighting	6	39.359	2.0716	0.9146	15099
237.50	6810	6	33.861	1.7854	0.9399	6039
215.00	6810-2	6	24.943	1.3080	0.9170	2156
199.00	PR-950	6	20.187	1.0297	0.7896	1629
187.00	Pirod Delta Mount (3)	6	17.742	0.8715	0.6266	3682
186.75	Guy	6	17.698	0.8688	0.6231	3785
177.00	Sabre 12' T-Boom (1) (Ramaker)	10	16.101	0.7813	0.5054	15176
172.00	PR-950	10	15.352	0.7503	0.4619	16302
150.00	4' Grid Dish	10	12.221	0.6538	0.3242	10106
130.00	2' Standoff	10	9.796	0.4930	0.3342	6057
126.75	Guy	10	9.466	0.4598	0.3389	5813
123.00	Small Beacon	10	9.112	0.4243	0.3444	5575
66.75	Guy	10	5.316	0.2922	0.3599	61216

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	200	Leg	A325N	0.7500	3	2971.27	19389.10	0.153 ✔	1.333	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	180	Leg	A325N	0.7500	3	0.00	19438.50	0.000 ✔	1.333	Bolt Tension
T3	160	Leg	A325N	0.7500	3	514.88	19432.70	0.026 ✔	1.333	Bolt Tension
T4	140	Leg	A325N	0.7500	3	0.00	19436.70	0.000 ✔	1.333	Bolt Tension
T5	120	Leg	A325N	0.7500	3	0.00	19438.20	0.000 ✔	1.333	Bolt Tension
T6	100	Leg	A325N	0.7500	3	0.00	19438.60	0.000 ✔	1.333	Bolt Tension
T7	80	Leg	A325N	0.7500	3	0.00	19437.40	0.000 ✔	1.333	Bolt Tension
T8	60	Leg	A325N	0.7500	3	0.00	19438.40	0.000 ✔	1.333	Bolt Tension
T9	40	Leg	A325N	0.7500	3	0.00	19438.50	0.000 ✔	1.333	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T1	186.75 (A) (491)	9/16 EHS	3500.00	35000.04	13944.40	17500.00	2.000	2.510 ✔
	186.75 (A) (492)	9/16 EHS	3500.00	35000.04	13519.00	17500.00	2.000	2.589 ✔
	186.75 (B) (487)	9/16 EHS	3500.00	35000.04	13502.00	17500.00	2.000	2.592 ✔
	186.75 (B) (488)	9/16 EHS	3500.00	35000.04	13720.40	17500.00	2.000	2.551 ✔
	186.75 (C) (483)	9/16 EHS	3500.00	35000.04	13763.00	17500.00	2.000	2.543 ✔
	186.75 (C) (484)	9/16 EHS	3500.00	35000.04	13933.60	17500.00	2.000	2.512 ✔
T4	126.75 (A) (500)	9/16 EHS	3500.00	35000.04	11284.40	17500.00	2.000	3.102 ✔
	126.75 (B) (499)	9/16 EHS	3500.00	35000.04	11337.40	17500.00	2.000	3.087 ✔
	126.75 (C) (495)	9/16 EHS	3500.00	35000.04	11315.70	17500.00	2.000	3.093 ✔
T7	66.75 (A) (506)	7/16 EHS	2080.00	20800.02	6032.13	10400.00	2.000	3.448 ✔
	66.75 (B) (505)	7/16 EHS	2080.00	20800.02	6044.23	10400.00	2.000	3.441 ✔
	66.75 (C) (501)	7/16 EHS	2080.00	20800.02	6052.21	10400.00	2.000	3.437 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
L1	250 - 200 (1)	P12x.5	50.00	50.00	138.4	7.794	19.2423	-3913.50	149972.00	0.026

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	250 - 200 (1)	P12x.5	74137.25	-15.687	23.100	0.679	0.00	0.000	23.100	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	250 - 200 (1)	P12x.5	0.026	0.679	0.000	0.705 ✔	1.066	H1-3 ✔

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-45131.30	60975.90	0.740
T2	180 - 160	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-36822.50	60975.90	0.604
T3	160 - 140	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-36393.90	60975.90	0.597
T4	140 - 120	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-48716.90	60975.90	0.799
T5	120 - 100	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-42179.60	60975.90	0.692
T6	100 - 80	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-21818.80	60975.90	0.358*
T7	80 - 60	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-24330.50	60975.90	0.399*
T8	60 - 40	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-25384.50	60975.90	0.416*
T9	40 - 20	2	20.00	3.25	78.0 K=1.00	1.00	19.409	3.1416	-34786.50	60975.90	0.570
T10	20 - 6.5	2 1/4	13.50	3.25	69.3 K=1.00	1.00	21.061	3.9761	-27026.20	83740.00	0.323*
T11	6.5 - 0	2 1/4	6.66	1.82	38.8 K=1.00	0.90	23.409	3.9761	-27132.50	93075.80	0.292*

* DL controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T2	180 - 160	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	160 - 140	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	140 - 120	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T5	120 - 100	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	100 - 80	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T7	80 - 60	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T8	60 - 40	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T9	40 - 20	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T10	20 - 6.5	2 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	6.5 - 0	2 1/4	805.34	-8.642	37.500	0.230	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	2	0.740	0.000	0.000	0.740 ✔	1.333	H1-3 ✔
T2	180 - 160	2	0.604	0.000	0.000	0.604 ✔	1.333	H1-3 ✔
T3	160 - 140	2	0.597	0.000	0.000	0.597 ✔	1.333	H1-3 ✔
T4	140 - 120	2	0.799	0.000	0.000	0.799 ✔	1.333	H1-3 ✔
T5	120 - 100	2	0.692	0.000	0.000	0.692 ✔	1.333	H1-3 ✔
T6	100 - 80	2	0.358	0.000	0.000	0.358* ✔	1.000	H1-3 ✔
T7	80 - 60	2	0.399	0.000	0.000	0.399* ✔	1.000	H1-3 ✔
T8	60 - 40	2	0.416	0.000	0.000	0.416* ✔	1.000	H1-3 ✔
T9	40 - 20	2	0.570	0.000	0.000	0.570 ✔	1.333	H1-3 ✔
T10	20 - 6.5	2 1/4	0.323	0.000	0.000	0.323* ✔	1.000	H1-3 ✔
T11	6.5 - 0	2 1/4	0.292	0.230	0.000	0.522* ✔	1.000	H1-3 ✔

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-6720.38	5953.68	1.129 ✔
T2	180 - 160	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-6121.61	5953.68	1.028 ✔
T3	160 - 140	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-2998.87	5953.68	0.504 ✔
T4	140 - 120	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-4015.70	5953.68	0.674 ✔
T5	120 - 100	1	4.42	4.18	140.4	7.580	0.7854	-3674.19	5953.68	0.617

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=0.70					✓
T6	100 - 80	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-1570.12	5953.68	0.264 ✓
T7	80 - 60	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-2878.65	5953.68	0.484 ✓
T8	60 - 40	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-2645.13	5953.68	0.444 ✓
T9	40 - 20	1	4.42	4.18	140.4 K=0.70	7.580	0.7854	-1389.80	5953.68	0.233 ✓
T10	20 - 6.5	1 1/4	4.42	4.15	111.5 K=0.70	11.475	1.2272	-2309.21	14081.40	0.164 ✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-781.70	7115.35	0.110
T2	180 - 160	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-1092.03	7115.35	0.153
T3	160 - 140	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-630.36	7115.35	0.089
T4	140 - 120	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-843.80	7115.35	0.119
T5	120 - 100	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-730.57	7115.35	0.103
T6	100 - 80	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-377.91	7115.35	0.053*
T7	80 - 60	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-421.42	7115.35	0.059*
T8	60 - 40	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-439.67	7115.35	0.062*
T9	40 - 20	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-455.94	7115.35	0.064*
T10	20 - 6.5	7/8	3.00	2.81	108.0 K=0.70	11.940	0.6013	-468.11	7179.50	0.065*
T11	6.5 - 0	8x3/8	1.41	1.22	135.3 K=1.00	8.157	3.0000	-496.02	24469.80	0.020

* DL controls

Horizontal Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T2	180 - 160	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T3	160 - 140	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T4	140 - 120	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T5	120 - 100	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T6	100 - 80	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T7	80 - 60	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T8	60 - 40	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T9	40 - 20	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T10	20 - 6.5	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T11	6.5 - 0	8x3/8	-1054.23	-3.163	27.000	0.117	-17.37	-1.112	27.000	0.041

Horizontal Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	7/8	0.110	0.000	0.000	0.110 ✔	1.333	H1-3 ✔
T2	180 - 160	7/8	0.153	0.000	0.000	0.153 ✔	1.333	H1-3 ✔
T3	160 - 140	7/8	0.089	0.000	0.000	0.089 ✔	1.333	H1-3 ✔
T4	140 - 120	7/8	0.119	0.000	0.000	0.119 ✔	1.333	H1-3 ✔
T5	120 - 100	7/8	0.103	0.000	0.000	0.103 ✔	1.333	H1-3 ✔
T6	100 - 80	7/8	0.053	0.000	0.000	0.053* ✔	1.000	H1-3 ✔
T7	80 - 60	7/8	0.059	0.000	0.000	0.059* ✔	1.000	H1-3 ✔
T8	60 - 40	7/8	0.062	0.000	0.000	0.062* ✔	1.000	H1-3 ✔
T9	40 - 20	7/8	0.064	0.000	0.000	0.064* ✔	1.000	H1-3 ✔
T10	20 - 6.5	7/8	0.065	0.000	0.000	0.065* ✔	1.000	H1-3 ✔
T11	6.5 - 0	8x3/8	0.020	0.117	0.041	0.179 ✔	1.333	H1-3 ✔

* DL controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.03	9384.48	0.000 ✔
T2	180 - 160	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.02	9384.48	0.000 ✔
T3	160 - 140	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.02	9384.48	0.000 ✔
T4	140 - 120	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.02	9384.48	0.000 ✔
T5	120 - 100	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.01	9384.48	0.000 ✔
T6	100 - 80	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.01	9384.48	0.000 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T7	80 - 60	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.01	9384.48	0.000 ✓
T8	60 - 40	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.01	9384.48	0.000 ✓
T9	40 - 20	7/8	1.50	1.42	77.7 K=1.00	15.607	0.6013	-0.01	9384.48	0.000 ✓
T10	20 - 6.5	7/8	1.50	1.41	77.2 K=1.00	15.669	0.6013	-0.01	9422.06	0.000 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	L3x3x3/8	3.00	2.83	89.0 K=1.54	14.328	2.1100	-973.25	30231.60	0.032
T2	180 - 160	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-1613.53	7115.35	0.227
T3	160 - 140	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-360.62	7115.35	0.051
T4	140 - 120	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-969.02	7115.35	0.136
T5	120 - 100	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-919.21	7115.35	0.129
T6	100 - 80	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-335.05	7115.35	0.047
T7	80 - 60	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-190.67	7115.35	0.027
T8	60 - 40	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-615.34	7115.35	0.086
T9	40 - 20	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-194.27	7115.35	0.027
T10	20 - 6.5	7/8	3.00	2.81	108.0 K=0.70	11.940	0.6013	-377.58	7179.50	0.053
T11	6.5 - 0	8x3/8	2.78	2.59	286.9 K=1.00	21.600	3.0000	0.00	5442.71	0.000

Top Girt Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	L3x3x3/8	0.00	0.000	23.760	0.000	0.00	0.000	23.760	0.000
T2	180 - 160	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T3	160 - 140	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T4	140 - 120	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T5	120 - 100	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T6	100 - 80	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T7	80 - 60	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T8	60 - 40	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T9	40 - 20	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T10	20 - 6.5	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T11	6.5 - 0	8x3/8	-949.94	-2.850	27.000	0.106	-19.62	-1.256	27.000	0.047

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	L3x3x3/8	0.032	0.000	0.000	0.032 ✔	1.333	H1-3 ✔
T2	180 - 160	7/8	0.227	0.000	0.000	0.227 ✔	1.333	H1-3 ✔
T3	160 - 140	7/8	0.051	0.000	0.000	0.051 ✔	1.333	H1-3 ✔
T4	140 - 120	7/8	0.136	0.000	0.000	0.136 ✔	1.333	H1-3 ✔
T5	120 - 100	7/8	0.129	0.000	0.000	0.129 ✔	1.333	H1-3 ✔
T6	100 - 80	7/8	0.047	0.000	0.000	0.047 ✔	1.333	H1-3 ✔
T7	80 - 60	7/8	0.027	0.000	0.000	0.027 ✔	1.333	H1-3 ✔
T8	60 - 40	7/8	0.086	0.000	0.000	0.086 ✔	1.333	H1-3 ✔
T9	40 - 20	7/8	0.027	0.000	0.000	0.027 ✔	1.333	H1-3 ✔
T10	20 - 6.5	7/8	0.053	0.000	0.000	0.053 ✔	1.333	H1-3 ✔
T11	6.5 - 0	8x3/8	0.000	0.106	0.047	0.152 ✔	1.333	H1-3 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-1775.13	7115.35	0.249
T2	180 - 160	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-409.50	7115.35	0.058
T3	160 - 140	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-764.72	7115.35	0.107
T4	140 - 120	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-1149.69	7115.35	0.162
T5	120 - 100	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-478.74	7115.35	0.067
T6	100 - 80	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-142.63	7115.35	0.020
T7	80 - 60	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-729.00	7115.35	0.102
T8	60 - 40	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-266.54	7115.35	0.037
T9	40 - 20	7/8	3.00	2.83	108.8 K=0.70	11.833	0.6013	-315.25	7115.35	0.044
T11	6.5 - 0	8x3/8	0.72	0.54	59.5 K=1.00	17.477	3.0000	-214.84	52429.60	0.004

Bottom Girt Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T2	180 - 160	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T3	160 - 140	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T4	140 - 120	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T5	120 - 100	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T6	100 - 80	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T7	80 - 60	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T8	60 - 40	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T9	40 - 20	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T11	6.5 - 0	8x3/8	-1165.82	-3.497	27.000	0.130	4.22	-0.270	27.000	0.010

Bottom Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	7/8	0.249	0.000	0.000	0.249 ✔	1.333	H1-3 ✔
T2	180 - 160	7/8	0.058	0.000	0.000	0.058 ✔	1.333	H1-3 ✔
T3	160 - 140	7/8	0.107	0.000	0.000	0.107 ✔	1.333	H1-3 ✔
T4	140 - 120	7/8	0.162	0.000	0.000	0.162 ✔	1.333	H1-3 ✔
T5	120 - 100	7/8	0.067	0.000	0.000	0.067 ✔	1.333	H1-3 ✔
T6	100 - 80	7/8	0.020	0.000	0.000	0.020 ✔	1.333	H1-3 ✔
T7	80 - 60	7/8	0.102	0.000	0.000	0.102 ✔	1.333	H1-3 ✔
T8	60 - 40	7/8	0.037	0.000	0.000	0.037 ✔	1.333	H1-3 ✔
T9	40 - 20	7/8	0.044	0.000	0.000	0.044 ✔	1.333	H1-3 ✔
T11	6.5 - 0	8x3/8	0.004	0.130	0.010	0.144 ✔	1.333	H1-3 ✔

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	1	3.00	2.83	95.2 K=0.70	13.576	0.7854	-7646.18	10662.80	0.717
T4	140 - 120	3 1/2x3/8	3.00	2.83	314.1 K=1.00	21.600	1.3125	0.00	1986.89	0.000*
T7	80 - 60	3 1/2x3/8	3.00	2.83	314.1 K=1.00	21.600	1.3125	0.00	1986.89	0.000*

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	1	3.01	-0.367	27.000	0.014	0.00	0.000	27.000	0.000
T4	140 - 120	3 1/2x3/8	9.10	-0.143	27.000	0.005	0.00	0.000	27.000	0.000
T7	80 - 60	3 1/2x3/8	8.73	-0.137	27.000	0.005	0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	1	0.717	0.014	0.000	0.731 ✔	1.333	H1-3 ✔
T4	140 - 120	3 1/2x3/8	0.000	0.005	0.000	0.005* ✔	1.000	H1-3 ✔
T7	80 - 60	3 1/2x3/8	0.000	0.005	0.000	0.005* ✔	1.000	H1-3 ✔

* DL controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180 (485)	C12x20.7	3.00	2.92	92.5 K=1.00	13.910	6.0900	-4210.70	84711.90	0.050
T1	200 - 180 (486)	C12x20.7	3.00	2.92	92.5 K=1.00	13.910	6.0900	-4210.22	84711.90	0.050
T1	200 - 180 (489)	C12x20.7	3.00	2.92	92.5 K=1.00	13.910	6.0900	-4409.44	84711.90	0.052
T1	200 - 180 (490)	C12x20.7	3.00	2.92	92.5 K=1.00	13.910	6.0900	-4397.80	84711.90	0.052
T1	200 - 180 (493)	C12x20.7	3.00	2.92	92.5 K=1.00	13.910	6.0900	-4509.00	84711.90	0.053
T1	200 - 180 (494)	C12x20.7	3.00	2.92	92.5 K=1.00	13.910	6.0900	-4518.02	84711.90	0.053

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180 (485)	C12x20.7	-30837.17	-17.211	21.600	0.797	0.00	-0.000	21.600	0.000
T1	200 - 180 (486)	C12x20.7	-30910.83	-17.253	21.600	0.799	-0.00	-0.000	21.600	0.000
T1	200 - 180 (489)	C12x20.7	-31466.17	-17.563	21.600	0.813	0.00	-0.000	21.600	0.000
T1	200 - 180 (490)	C12x20.7	-31274.83	-17.456	21.600	0.808	-0.00	-0.000	21.600	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180 (493)	C12x20.7	-31692.42	-17.689	21.600	0.819	0.00	-0.000	21.600	0.000
T1	200 - 180 (494)	C12x20.7	-31755.92	-17.724	21.600	0.821	-0.00	-0.000	21.600	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180 (485)	C12x20.7	0.050	0.797	0.000	0.847 ✔	1.333	H1-3 ✔
T1	200 - 180 (486)	C12x20.7	0.050	0.799	0.000	0.848 ✔	1.333	H1-3 ✔
T1	200 - 180 (489)	C12x20.7	0.052	0.813	0.000	0.865 ✔	1.333	H1-3 ✔
T1	200 - 180 (490)	C12x20.7	0.052	0.808	0.000	0.860 ✔	1.333	H1-3 ✔
T1	200 - 180 (493)	C12x20.7	0.053	0.819	0.000	0.872 ✔	1.333	H1-3 ✔
T1	200 - 180 (494)	C12x20.7	0.053	0.821	0.000	0.874 ✔	1.333	H1-3 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	2	20.00	3.25	78.0	30.000	3.1416	41166.60	94247.80	0.437
T2	180 - 160	2	20.00	3.25	78.0	30.000	3.1416	8911.10	94247.80	0.095
T3	160 - 140	2	20.00	3.25	78.0	30.000	3.1416	1544.63	94247.80	0.016
T4	140 - 120	2	20.00	3.25	78.0	30.000	3.1416	12654.20	94247.80	0.134

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T2	180 - 160	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	160 - 140	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	140 - 120	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	2	0.437	0.000	0.000	0.437 ✔	1.333	H2-1 ✔
T2	180 - 160	2	0.095	0.000	0.000	0.095 ✔	1.333	H2-1 ✔
T3	160 - 140	2	0.016	0.000	0.000	0.016 ✔	1.333	H2-1 ✔
T4	140 - 120	2	0.134	0.000	0.000	0.134 ✔	1.333	H2-1 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	1	4.42	4.18	200.5	21.600	0.7854	6523.99	16964.60	0.385 ✔
T2	180 - 160	1	4.42	4.18	200.5	21.600	0.7854	5859.31	16964.60	0.345 ✔
T3	160 - 140	1	4.42	4.18	200.5	21.600	0.7854	2627.59	16964.60	0.155 ✔
T4	140 - 120	1	4.42	4.18	200.5	21.600	0.7854	3698.45	16964.60	0.218 ✔
T5	120 - 100	1	4.42	4.18	200.5	21.600	0.7854	3338.34	16964.60	0.197 ✔
T6	100 - 80	1	4.42	4.18	200.5	21.600	0.7854	1222.05	16964.60	0.072 ✔
T7	80 - 60	1	4.42	4.18	200.5	21.600	0.7854	2511.21	16964.60	0.148 ✔
T8	60 - 40	1	4.42	4.18	200.5	21.600	0.7854	2266.95	16964.60	0.134 ✔
T9	40 - 20	1	4.42	4.18	200.5	21.600	0.7854	1075.37	16964.60	0.063 ✔
T10	20 - 6.5	1 1/4	4.42	4.15	159.2	21.600	1.2272	2047.80	26507.20	0.077 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	3.00	2.83	155.4	21.600	0.6013	781.70	12988.50	0.060
T2	180 - 160	7/8	3.00	2.83	155.4	21.600	0.6013	1279.37	12988.50	0.099
T3	160 - 140	7/8	3.00	2.83	155.4	21.600	0.6013	630.36	12988.50	0.049
T4	140 - 120	7/8	3.00	2.83	155.4	21.600	0.6013	1626.70	12988.50	0.125
T5	120 - 100	7/8	3.00	2.83	155.4	21.600	0.6013	730.57	12988.50	0.056
T6	100 - 80	7/8	3.00	2.83	155.4	21.600	0.6013	377.91	12988.50	0.029*
T7	80 - 60	7/8	3.00	2.83	155.4	21.600	0.6013	1040.84	12988.50	0.080
T8	60 - 40	7/8	3.00	2.83	155.4	21.600	0.6013	439.67	12988.50	0.034*
T9	40 - 20	7/8	3.00	2.83	155.4	21.600	0.6013	455.94	12988.50	0.035*
T10	20 - 6.5	7/8	3.00	2.81	154.3	21.600	0.6013	468.11	12988.50	0.036*
T11	6.5 - 0	8x3/8	1.41	1.22	135.3	21.600	3.0000	496.12	64800.00	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$

* DL controls

Horizontal Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T2	180 - 160	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T3	160 - 140	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T4	140 - 120	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T5	120 - 100	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T6	100 - 80	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T7	80 - 60	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T8	60 - 40	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T9	40 - 20	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T10	20 - 6.5	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T11	6.5 - 0	8x3/8	-1075.51	3.227	27.000	0.120	-20.18	1.291	27.000	0.048

Horizontal Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	7/8	0.060	0.000	0.000	0.060 ✔	1.333	H2-1 ✔
T2	180 - 160	7/8	0.099	0.000	0.000	0.099 ✔	1.333	H2-1 ✔
T3	160 - 140	7/8	0.049	0.000	0.000	0.049 ✔	1.333	H2-1 ✔
T4	140 - 120	7/8	0.125	0.000	0.000	0.125 ✔	1.333	H2-1 ✔
T5	120 - 100	7/8	0.056	0.000	0.000	0.056 ✔	1.333	H2-1 ✔
T6	100 - 80	7/8	0.029	0.000	0.000	0.029* ✔	1.000	H2-1 ✔
T7	80 - 60	7/8	0.080	0.000	0.000	0.080 ✔	1.333	H2-1 ✔
T8	60 - 40	7/8	0.034	0.000	0.000	0.034* ✔	1.000	H2-1 ✔
T9	40 - 20	7/8	0.035	0.000	0.000	0.035* ✔	1.000	H2-1 ✔
T10	20 - 6.5	7/8	0.036	0.000	0.000	0.036* ✔	1.000	H2-1 ✔
T11	6.5 - 0	8x3/8	0.008	0.120	0.048	0.175 ✔	1.333	H2-1 ✔

* DL controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	1.50	1.42	77.7	21.600	0.6013	0.03	12988.50	0.000 ✔
T2	180 - 160	7/8	1.50	1.42	77.7	21.600	0.6013	0.02	12988.50	0.000 ✔
T3	160 - 140	7/8	1.50	1.42	77.7	21.600	0.6013	0.02	12988.50	0.000 ✔
T4	140 - 120	7/8	1.50	1.42	77.7	21.600	0.6013	0.02	12988.50	0.000 ✔
T5	120 - 100	7/8	1.50	1.42	77.7	21.600	0.6013	0.01	12988.50	0.000 ✔
T6	100 - 80	7/8	1.50	1.42	77.7	21.600	0.6013	0.01	12988.50	0.000 ✔
T7	80 - 60	7/8	1.50	1.42	77.7	21.600	0.6013	0.01	12988.50	0.000 ✔
T8	60 - 40	7/8	1.50	1.42	77.7	21.600	0.6013	0.01	12988.50	0.000 ✔
T9	40 - 20	7/8	1.50	1.42	77.7	21.600	0.6013	0.01	12988.50	0.000 ✔
T10	20 - 6.5	7/8	1.50	1.41	77.2	21.600	0.6013	0.01	12988.50	0.000 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	L3x3x3/8	3.00	2.83	37.2	21.600	2.1100	7386.96	45576.00	0.162*
T2	180 - 160	7/8	3.00	2.83	155.4	21.600	0.6013	1633.06	12988.50	0.126
T3	160 - 140	7/8	3.00	2.83	155.4	21.600	0.6013	460.49	12988.50	0.035
T4	140 - 120	7/8	3.00	2.83	155.4	21.600	0.6013	946.14	12988.50	0.073
T5	120 - 100	7/8	3.00	2.83	155.4	21.600	0.6013	1134.59	12988.50	0.087
T6	100 - 80	7/8	3.00	2.83	155.4	21.600	0.6013	486.45	12988.50	0.037
T7	80 - 60	7/8	3.00	2.83	155.4	21.600	0.6013	369.60	12988.50	0.028
T8	60 - 40	7/8	3.00	2.83	155.4	21.600	0.6013	749.28	12988.50	0.058
T9	40 - 20	7/8	3.00	2.83	155.4	21.600	0.6013	321.65	12988.50	0.025
T10	20 - 6.5	7/8	3.00	2.81	154.3	21.600	0.6013	570.68	12988.50	0.044
T11	6.5 - 0	8x3/8	2.78	2.59	286.9	21.600	3.0000	1416.56	64800.00	0.022

* DL controls

Top Girt Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	L3x3x3/8	0.00	0.000	23.760	0.000	0.00	0.000	23.760	0.000
T2	180 - 160	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T3	160 - 140	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T4	140 - 120	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T5	120 - 100	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T6	100 - 80	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T7	80 - 60	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T8	60 - 40	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T9	40 - 20	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T10	20 - 6.5	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T11	6.5 - 0	8x3/8	-949.94	2.850	27.000	0.106	-19.62	1.256	27.000	0.047

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	L3x3x3/8	0.162	0.000	0.000	0.162* ✔	1.000	H2-1 ✔
T2	180 - 160	7/8	0.126	0.000	0.000	0.126 ✔	1.333	H2-1 ✔
T3	160 - 140	7/8	0.035	0.000	0.000	0.035 ✔	1.333	H2-1 ✔
T4	140 - 120	7/8	0.073	0.000	0.000	0.073 ✔	1.333	H2-1 ✔
T5	120 - 100	7/8	0.087	0.000	0.000	0.087 ✔	1.333	H2-1 ✔
T6	100 - 80	7/8	0.037	0.000	0.000	0.037 ✔	1.333	H2-1 ✔
T7	80 - 60	7/8	0.028	0.000	0.000	0.028 ✔	1.333	H2-1 ✔
T8	60 - 40	7/8	0.058	0.000	0.000	0.058 ✔	1.333	H2-1 ✔
T9	40 - 20	7/8	0.025	0.000	0.000	0.025 ✔	1.333	H2-1 ✔
T10	20 - 6.5	7/8	0.044	0.000	0.000	0.044 ✔	1.333	H2-1 ✔
T11	6.5 - 0	8x3/8	0.022	0.106	0.047	0.174 ✔	1.333	H2-1 ✔

* DL controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	3.00	2.83	155.4	21.600	0.6013	1904.42	12988.50	0.147
T2	180 - 160	7/8	3.00	2.83	155.4	21.600	0.6013	499.45	12988.50	0.038
T3	160 - 140	7/8	3.00	2.83	155.4	21.600	0.6013	963.37	12988.50	0.074
T4	140 - 120	7/8	3.00	2.83	155.4	21.600	0.6013	1135.20	12988.50	0.087
T5	120 - 100	7/8	3.00	2.83	155.4	21.600	0.6013	555.32	12988.50	0.043
T6	100 - 80	7/8	3.00	2.83	155.4	21.600	0.6013	216.02	12988.50	0.017
T7	80 - 60	7/8	3.00	2.83	155.4	21.600	0.6013	838.26	12988.50	0.065
T8	60 - 40	7/8	3.00	2.83	155.4	21.600	0.6013	393.98	12988.50	0.030
T9	40 - 20	7/8	3.00	2.83	155.4	21.600	0.6013	408.73	12988.50	0.031
T10	20 - 6.5	7/8	3.00	2.81	154.3	21.600	0.6013	2060.84	12988.50	0.159*

* DL controls

Bottom Girt Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T2	180 - 160	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T3	160 - 140	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T4	140 - 120	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T5	120 - 100	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T6	100 - 80	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T7	80 - 60	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T8	60 - 40	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T9	40 - 20	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T10	20 - 6.5	7/8	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000

Bottom Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	7/8	0.147	0.000	0.000	0.147 ✔	1.333	H2-1 ✔
T2	180 - 160	7/8	0.038	0.000	0.000	0.038 ✔	1.333	H2-1 ✔
T3	160 - 140	7/8	0.074	0.000	0.000	0.074 ✔	1.333	H2-1 ✔
T4	140 - 120	7/8	0.087	0.000	0.000	0.087 ✔	1.333	H2-1 ✔
T5	120 - 100	7/8	0.043	0.000	0.000	0.043 ✔	1.333	H2-1 ✔
T6	100 - 80	7/8	0.017	0.000	0.000	0.017 ✔	1.333	H2-1 ✔
T7	80 - 60	7/8	0.065	0.000	0.000	0.065 ✔	1.333	H2-1 ✔
T8	60 - 40	7/8	0.030	0.000	0.000	0.030 ✔	1.333	H2-1 ✔
T9	40 - 20	7/8	0.031	0.000	0.000	0.031 ✔	1.333	H2-1 ✔
T10	20 - 6.5	7/8	0.159	0.000	0.000	0.159* ✔	1.000	H2-1 ✔

* DL controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	1	3.00	2.83	136.0	21.600	0.7854	7734.49	16964.60	0.456
T4	140 - 120	3 1/2x3/8	3.00	2.83	314.1	21.600	1.3125	3550.57	28350.00	0.125
T7	80 - 60	3 1/2x3/8	3.00	2.83	314.1	21.600	1.3125	2271.82	28350.00	0.080

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180	1	3.01	0.367	27.000	0.014	0.00	0.000	27.000	0.000
T4	140 - 120	3 1/2x3/8	5.02	0.079	27.000	0.003	0.00	0.000	27.000	0.000
T7	80 - 60	3 1/2x3/8	5.02	0.079	27.000	0.003	0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180	1	0.456	0.014	0.000	0.470 ✔	1.333	H2-1 ✔
T4	140 - 120	3 1/2x3/8	0.125	0.003	0.000	0.128 ✔	1.333	H2-1 ✔
T7	80 - 60	3 1/2x3/8	0.080	0.003	0.000	0.083 ✔	1.333	H2-1 ✔

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	200 - 180 (485)	C12x20.7	3.00	2.92	43.8	21.600	6.0900	101.31	131544.00	0.001
T1	200 - 180 (486)	C12x20.7	3.00	2.92	43.8	21.600	6.0900	323.10	131544.00	0.002
T1	200 - 180 (489)	C12x20.7	3.00	2.92	43.8	21.600	6.0900	3611.96	131544.00	0.027
T1	200 - 180 (490)	C12x20.7	3.00	2.92	43.8	21.600	6.0900	366.70	131544.00	0.003
T1	200 - 180 (493)	C12x20.7	3.00	2.92	43.8	21.600	6.0900	95.21	131544.00	0.001
T1	200 - 180 (494)	C12x20.7	3.00	2.92	43.8	21.600	6.0900	3762.98	131544.00	0.029

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	200 - 180 (485)	C12x20.7	-31853.58	17.779	21.600	0.823	-0.00	0.000	27.000	0.000
T1	200 - 180 (486)	C12x20.7	-32242.00	17.996	21.600	0.833	0.00	0.000	27.000	0.000
T1	200 - 180 (489)	C12x20.7	-26525.75	14.805	21.600	0.685	-0.00	0.000	27.000	0.000
T1	200 - 180 (490)	C12x20.7	-32015.00	17.869	21.600	0.827	-0.00	0.000	27.000	0.000
T1	200 - 180 (493)	C12x20.7	-31867.25	17.786	21.600	0.823	0.00	0.000	27.000	0.000
T1	200 - 180 (494)	C12x20.7	-26683.58	14.893	21.600	0.689	0.00	0.000	27.000	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	200 - 180 (485)	C12x20.7	0.001	0.823	0.000	0.824 ✔	1.333	H2-1 ✔
T1	200 - 180 (486)	C12x20.7	0.002	0.833	0.000	0.836 ✔	1.333	H2-1 ✔
T1	200 - 180 (489)	C12x20.7	0.027	0.685	0.000	0.713 ✔	1.333	H2-1 ✔
T1	200 - 180 (490)	C12x20.7	0.003	0.827	0.000	0.830 ✔	1.333	H2-1 ✔
T1	200 - 180 (493)	C12x20.7	0.001	0.823	0.000	0.824 ✔	1.333	H2-1 ✔
T1	200 - 180 (494)	C12x20.7	0.029	0.689	0.000	0.718 ✔	1.333	H2-1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	250 - 200	Pole	P12x.5	1	-3913.50	159930.15	66.1	Pass
T1	200 - 180	Leg	2	3	-45131.30	81280.87	55.5	Pass
T2	180 - 160	Leg	2	51	-36822.50	81280.87	45.3	Pass
T3	160 - 140	Leg	2	99	-36393.90	81280.87	44.8	Pass
T4	140 - 120	Leg	2	147	-48716.90	81280.87	59.9	Pass
T5	120 - 100	Leg	2	195	-42179.60	81280.87	51.9	Pass
T6	100 - 80	Leg	2	244	-21818.80	60975.90	35.8	Pass
T7	80 - 60	Leg	2	292	-24330.50	60975.90	39.9	Pass
T8	60 - 40	Leg	2	340	-25384.50	60975.90	41.6	Pass
T9	40 - 20	Leg	2	386	-34786.50	81280.87	42.8	Pass
T10	20 - 6.5	Leg	2 1/4	436	-27026.20	83740.00	32.3	Pass
T11	6.5 - 0	Leg	2 1/4	470	-27132.50	93075.80	52.2	Pass
T1	200 - 180	Diagonal	1	13	-6720.38	7936.26	84.7	Pass
T2	180 - 160	Diagonal	1	96	-6121.61	7936.26	77.1	Pass
T3	160 - 140	Diagonal	1	107	-2998.87	7936.26	37.8	Pass
T4	140 - 120	Diagonal	1	157	-4015.70	7936.26	50.6	Pass
T5	120 - 100	Diagonal	1	240	-3674.19	7936.26	46.3	Pass
T6	100 - 80	Diagonal	1	288	-1570.12	7936.26	19.8	Pass
T7	80 - 60	Diagonal	1	299	-2878.65	7936.26	36.3	Pass
T8	60 - 40	Diagonal	1	382	-2645.13	7936.26	33.3	Pass
T9	40 - 20	Diagonal	1	396	-1389.80	7936.26	17.5	Pass
T10	20 - 6.5	Diagonal	1 1/4	444	-2309.21	18770.51	12.3	Pass
T1	200 - 180	Horizontal	7/8	43	-781.70	9484.76	8.2	Pass
T2	180 - 160	Horizontal	7/8	93	-1092.03	9484.76	11.5	Pass
T3	160 - 140	Horizontal	7/8	111	-630.36	9484.76	6.6	Pass
T4	140 - 120	Horizontal	7/8	168	1626.70	17313.67	9.4	Pass
T5	120 - 100	Horizontal	7/8	215	-730.57	9484.76	7.7	Pass
T6	100 - 80	Horizontal	7/8	256	-377.91	7115.35	5.3	Pass
T7	80 - 60	Horizontal	7/8	312	1040.84	17313.67	6.0	Pass
T8	60 - 40	Horizontal	7/8	352	-439.67	7115.35	6.2	Pass
T9	40 - 20	Horizontal	7/8	408	-455.94	7115.35	6.4	Pass
T10	20 - 6.5	Horizontal	7/8	448	-468.11	7179.50	6.5	Pass
T11	6.5 - 0	Horizontal	8x3/8	479	-496.02	32618.24	13.4	Pass
T1	200 - 180	Secondary Horizontal	7/8	21	-0.02	12509.51	0.0	Pass
T2	180 - 160	Secondary Horizontal	7/8	97	-0.02	12509.51	0.0	Pass
T3	160 - 140	Secondary Horizontal	7/8	145	-0.02	12509.51	0.0	Pass
T4	140 - 120	Secondary Horizontal	7/8	193	-0.02	12509.51	0.0	Pass
T5	120 - 100	Secondary Horizontal	7/8	241	-0.01	12509.51	0.0	Pass
T6	100 - 80	Secondary Horizontal	7/8	254	-0.01	12509.51	0.0	Pass
T7	80 - 60	Secondary Horizontal	7/8	302	-0.01	12509.51	0.0	Pass
T8	60 - 40	Secondary Horizontal	7/8	350	-0.01	12509.51	0.0	Pass
T9	40 - 20	Secondary Horizontal	7/8	398	-0.01	12509.51	0.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T10	20 - 6.5	Secondary Horizontal	7/8	460	-0.01	12559.60	0.0	Pass
T1	200 - 180	Top Girt	L3x3x3/8	7	7386.96	45576.00	16.2	Pass
T2	180 - 160	Top Girt	7/8	55	-1613.53	9484.76	17.0	Pass
T3	160 - 140	Top Girt	7/8	101	-360.62	9484.76	3.8	Pass
T4	140 - 120	Top Girt	7/8	149	-969.02	9484.76	10.2	Pass
T5	120 - 100	Top Girt	7/8	199	-919.21	9484.76	9.7	Pass
T6	100 - 80	Top Girt	7/8	247	-335.05	9484.76	3.5	Pass
T7	80 - 60	Top Girt	7/8	294	369.60	17313.67	2.1	Pass
T8	60 - 40	Top Girt	7/8	343	-615.34	9484.76	6.5	Pass
T9	40 - 20	Top Girt	7/8	389	-194.27	9484.76	2.0	Pass
T10	20 - 6.5	Top Girt	7/8	438	-377.58	9570.27	3.9	Pass
T11	6.5 - 0	Top Girt	8x3/8	472	1416.56	86378.40	13.0	Pass
T1	200 - 180	Bottom Girt	7/8	10	-1775.13	9484.76	18.7	Pass
T2	180 - 160	Bottom Girt	7/8	57	-409.50	9484.76	4.3	Pass
T3	160 - 140	Bottom Girt	7/8	104	-764.72	9484.76	8.1	Pass
T4	140 - 120	Bottom Girt	7/8	153	-1149.69	9484.76	12.1	Pass
T5	120 - 100	Bottom Girt	7/8	202	-478.74	9484.76	5.0	Pass
T6	100 - 80	Bottom Girt	7/8	249	-142.63	9484.76	1.5	Pass
T7	80 - 60	Bottom Girt	7/8	298	-729.00	9484.76	7.7	Pass
T8	60 - 40	Bottom Girt	7/8	344	-266.54	9484.76	2.8	Pass
T9	40 - 20	Bottom Girt	7/8	393	-315.25	9484.76	3.3	Pass
T10	20 - 6.5	Bottom Girt	7/8	441	2060.84	12988.50	15.9	Pass
T11	6.5 - 0	Bottom Girt	8x3/8	475	-214.84	69888.66	10.8	Pass
T1	200 - 180	Guy A@186.75	9/16	491	13944.40	17500.00	79.7	Pass
T4	140 - 120	Guy A@126.75	9/16	500	11284.40	17500.00	64.5	Pass
T7	80 - 60	Guy A@66.75	7/16	506	6032.13	10400.00	58.0	Pass
T1	200 - 180	Guy B@186.75	9/16	488	13720.40	17500.00	78.4	Pass
T4	140 - 120	Guy B@126.75	9/16	499	11337.40	17500.00	64.8	Pass
T7	80 - 60	Guy B@66.75	7/16	505	6044.23	10400.00	58.1	Pass
T1	200 - 180	Guy C@186.75	9/16	484	13933.60	17500.00	79.6	Pass
T4	140 - 120	Guy C@126.75	9/16	495	11315.70	17500.00	64.7	Pass
T7	80 - 60	Guy C@66.75	7/16	501	6052.21	10400.00	58.2	Pass
T1	200 - 180	Top Guy Pull-Off@186.75	1	23	-7646.18	14213.51	54.8	Pass
T4	140 - 120	Top Guy Pull-Off@126.75	3 1/2x3/8	498	3550.57	37790.55	9.6	Pass
T7	80 - 60	Top Guy Pull-Off@66.75	3 1/2x3/8	504	2271.82	37790.55	6.2	Pass
T1	200 - 180	Torque Arm Top@186.75	C12x20.7	494	-4518.02	112920.96	65.6	Pass
							Summary	
						Pole (L1)	66.1	Pass
						Leg (T4)	59.9	Pass
						Diagonal (T1)	84.7	Pass
						Horizontal (T11)	13.4	Pass
						Secondary Horizontal (T1)	0.0	Pass
						Top Girt (T2)	17.0	Pass
						Bottom Girt (T1)	18.7	Pass
						Guy A (T1)	79.7	Pass
						Guy B (T1)	78.4	Pass
						Guy C (T1)	79.6	Pass
						Top Guy Pull-Off (T1)	54.8	Pass
						Torque Arm Top (T1)	65.6	Pass
						Bolt Checks	11.5	Pass
						RATING =	**84.7**	**Pass**

APPENDIX C

MOUNT CALCULATIONS

WINDSPEED BY LOCATION

Applied Technology Council

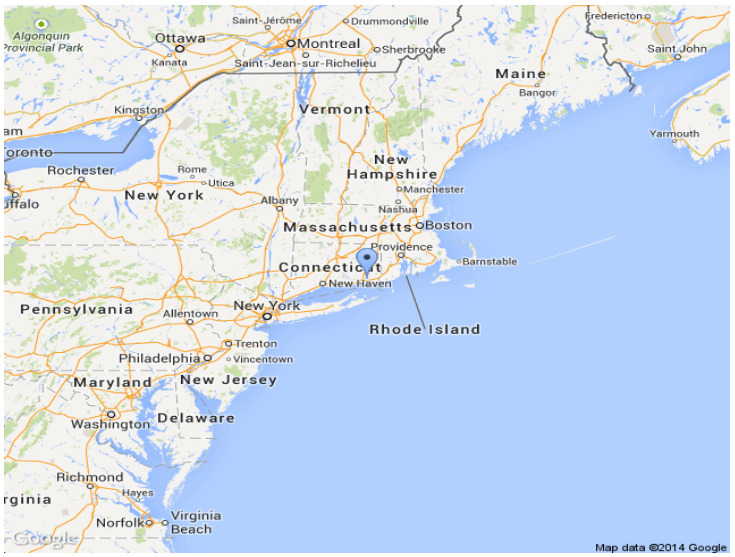
Search Results

Latitude: 41.3851
Longitude: -72.0699

ASCE 7-10 Wind Speeds (3-sec peak gust MPH*):

Risk Category I: 124
Risk Category II: 134
Risk Category III-IV: 144
MRI 10 Year:** 80
MRI 25 Year:** 90
MRI 50 Year:** 99
MRI 100 Year:** 108

ASCE 7-05: 120
ASCE 7-93: 86



*MPH(Miles per hour)

**MRI Mean Recurrence Interval (years)

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

Sponsored by the ATC Endowment Fund Applied Technology Council 201 Redwood Shores Parkway, Suite 240 Redwood City, California 94065 (650) 595-1542

RAMAKER & ASSOCIATES, INC.
1120 Dallas Street
Sauk City, WI 53583
Office: (608) 643-4100

Job:	29461
Project:	Citadel/Groton (CT33XC584)
By:	JMO
Date:	7/22/2014

Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	C		Exposure Category
V:	120	mph	Basic Wind Speed (Annex B)
z:	187	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_z:	1.44		Velocity Pressure Coefficient (2.6.5.2)
K_{zt}:	1		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z =	**50.6**	**psf**	

G_h:	1.00	Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_f	**$F = q_z G_h C_a A_a$**	
Pipe2STD x 12 ft	144.0 in	2.4 in	60.5	Round	1.200	2.38 sf	**144.4 lb**	12.0 plf
Pipe2STD x 3 ft	36.0 in	2.4 in	15.1	Round	0.981	0.60 sf	**29.5 lb**	9.8 plf
APXV9TM14-ALU-120	56.3 in	12.6 in	4.5	Flat	1.287	4.93 sf	**320.7 lb**	
TD-RRH8x20	26.1 in	18.6 in	1.4	Flat	1.200	3.37 sf	**204.6 lb**	
APXVSPP18-C-A20	72.0 in	11.9 in	6.1	Flat	1.358	5.95 sf	**408.3 lb**	
ET-X-TU-42-15-37-18-iR-SP	48.0 in	18.1 in	2.7	Flat	1.207	6.03 sf	**368.2 lb**	
1900MHz 4x45W RRH	25.1 in	11.1 in	2.3	Flat	1.200	1.93 sf	**117.4 lb**	
800MHz 2x50W RRH	19.0 in	13.0 in	1.5	Flat	1.200	1.72 sf	**104.1 lb**	

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Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

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V:	120	mph	Basic Wind Speed (Annex B)
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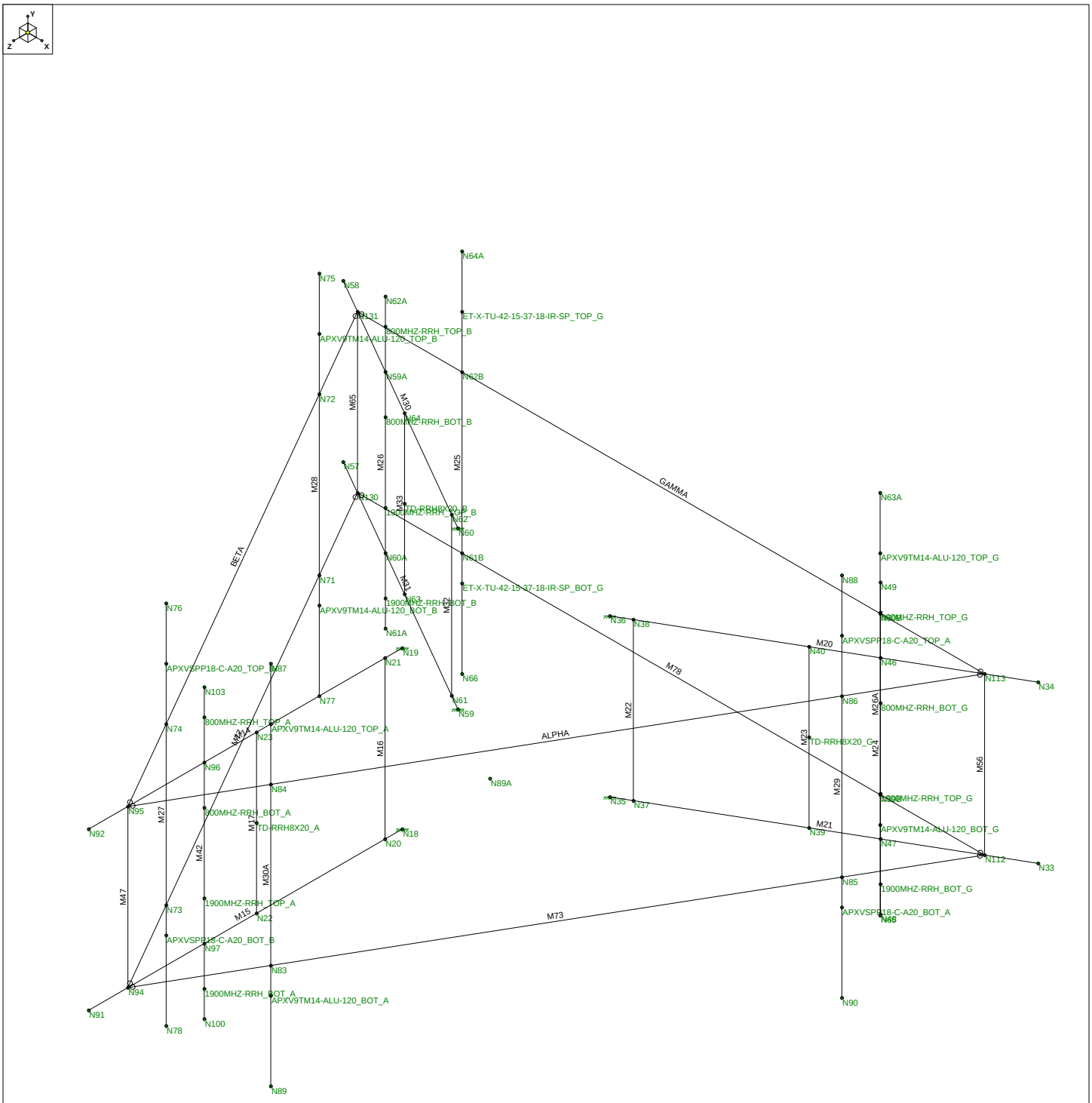
K_{zt}:	1		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z =	**50.6**	**psf**	

G_h:	1.00	Appurtenances and their Connections

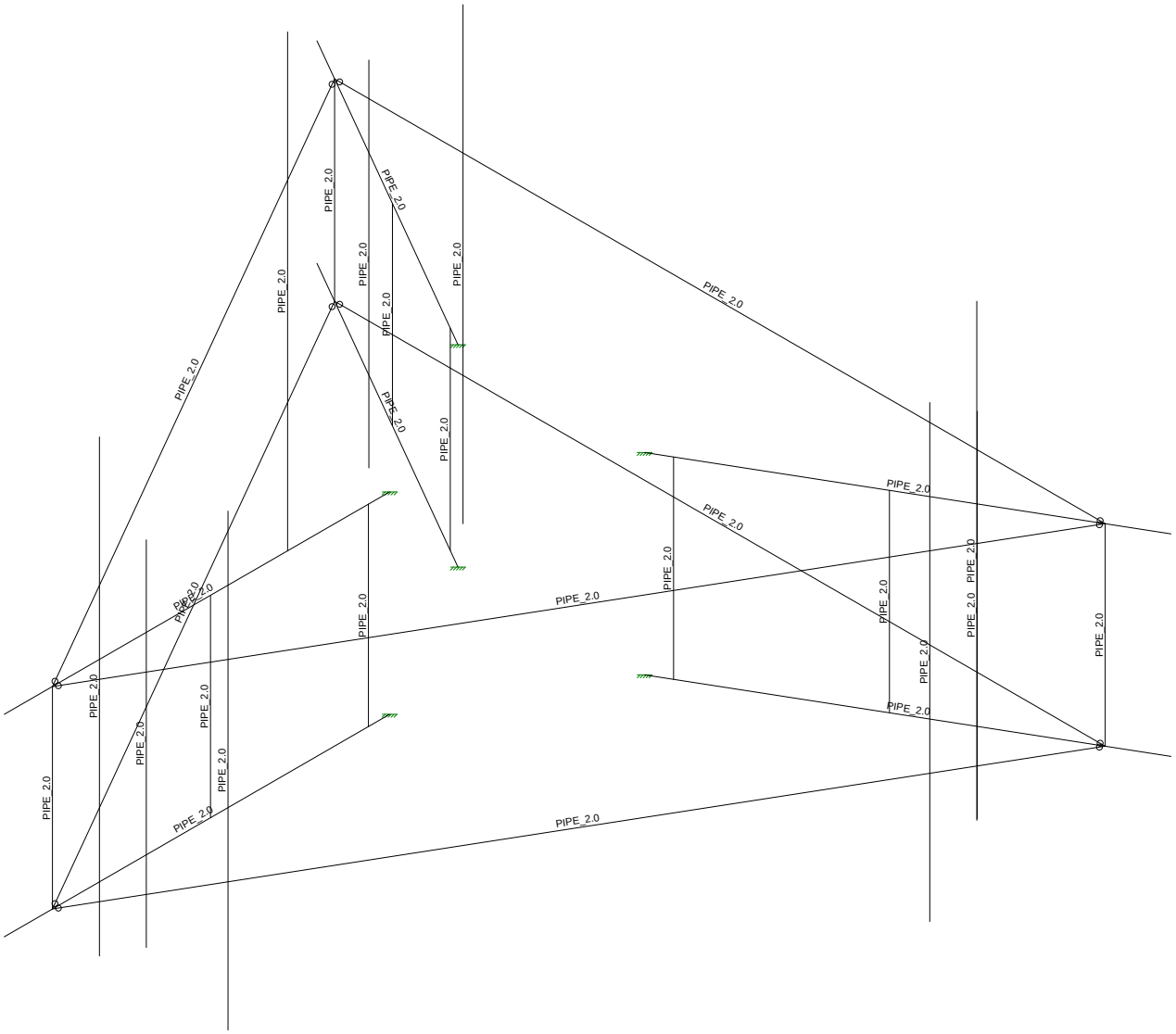
Mount & Antenna Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_f	**$F = q_z G_h C_a A_a$**	
Pipe2STD x 12 ft	144.0 in	2.4 in	60.5	Round	1.200	2.38 sf	**144.4 lb**	12.0 plf
Pipe2STD x 3 ft	36.0 in	2.4 in	15.1	Round	0.981	0.60 sf	**29.5 lb**	9.8 plf
APXV9TM14-ALU-120	56.3 in	6.3 in	8.9	Flat	1.465	2.46 sf	**182.4 lb**	
TD-RRH8x20	26.1 in	6.7 in	3.9	Flat	1.262	1.21 sf	**77.5 lb**	
APXVSPP18-C-A20	72.0 in	7.0 in	10.3	Flat	1.509	3.50 sf	**267.4 lb**	
ET-X-TU-42-15-37-18-iR-SP	48.0 in	7.1 in	6.8	Flat	1.389	2.37 sf	**166.3 lb**	
1900MHz 4x45W RRH	25.1 in	10.7 in	2.3	Flat	1.200	1.86 sf	**113.1 lb**	
800MHz 2x50W RRH	19.0 in	12.2 in	1.6	Flat	1.200	1.61 sf	**97.7 lb**	



Envelope Only Solution

Ramaker & Associates	Citadel/Groton (CT33XC584)	SK - 1
JMO		July 22, 2014 at 3:59 PM
29461		29461 Mount.r3d



Envelope Only Solution

Ramaker & Associates	Citadel/Groton (CT33XC584)	SK - 2
JMO		July 22, 2014 at 3:58 PM
29461		29461 Mount.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..Density[k/ft...		Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M47	N94	N95			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
2	M56	N112	N113			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
3	M65	N130	N131			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
4	M73	N94	N112			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
5	ALPHA	N95	N113			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
6	BETA	N95	N131			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
7	GAMMA	N131	N113			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
8	M77	N94	N130			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
9	M78	N130	N112			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
10	M14	N19	N92			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
11	M15	N18	N91			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
12	M16	N21	N20			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
13	M17	N23	N22			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
14	M20	N36	N34			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
15	M21	N35	N33			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
16	M22	N38	N37			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
17	M23	N40	N39			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
18	M30	N60	N58			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
19	M31	N59	N57			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
20	M32	N62	N61			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
21	M33	N64	N63			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
22	M42	N103	N100			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
23	M24	N49	N48			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
24	M26	N62A	N61A			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
25	M25	N64A	N66			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
26	M26A	N63A	N65			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
27	M27	N76	N78			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
28	M28	N75	N77			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
29	M29	N88	N90			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
30	M30A	N87	N89			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N89A	0	0	0	0	
2	N91	0	0	7.678189	0	
3	N92	0	3	7.678189	0	
4	N94	0	0	6.928189	0	
5	N95	0	3	6.928189	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
6	N112	5.999988	0	-3.464095	0	
7	N113	5.999988	3	-3.464095	0	
8	N130	-5.999988	0	-3.464095	0	
9	N131	-5.999988	3	-3.464095	0	
10	N18	0	0	1.678189	0	
11	N19	0	3	1.678189	0	
12	N20	0	0	2.008189	0	
13	N21	0	3	2.008189	0	
14	N22	0	0	4.468189	0	
15	N23	0	3	4.468189	0	
16	N33	6.649507	0	-3.839094	0	
17	N34	6.649507	3	-3.839094	0	
18	N35	1.453354	0	-0.839094	0	
19	N36	1.453354	3	-0.839094	0	
20	N37	1.739143	0	-1.004094	0	
21	N38	1.739143	3	-1.004094	0	
22	N39	3.869565	0	-2.234094	0	
23	N40	3.869565	3	-2.234094	0	
24	N57	-6.649507	0	-3.839094	0	
25	N58	-6.649507	3	-3.839094	0	
26	N59	-1.453354	0	-0.839094	0	
27	N60	-1.453354	3	-0.839094	0	
28	N61	-1.739143	0	-1.004094	0	
29	N62	-1.739143	3	-1.004094	0	
30	N63	-3.869565	0	-2.234094	0	
31	N64	-3.869565	3	-2.234094	0	
32	N96	0	3	5.468189	0	
33	N97	0	0	5.468189	0	
34	N100	0	-1.25	5.468189	0	
35	N103	0	4.25	5.468189	0	
36	1900MHZ-RRH_TOP_A	0	.75	5.468189	0	
37	800MHZ-RRH_TOP_A	0	3.75	5.468189	0	
38	TD-RRH8X20_A	0	1.5	4.468189	0	
39	1900MHZ-RRH_BOT_A	0	-.75	5.468189	0	
40	800MHZ-RRH_BOT_A	0	2.25	5.468189	0	
41	N46	4.735591	3	-2.734095	0	
42	N47	4.735591	0	-2.734095	0	
43	N48	4.735591	-1.25	-2.734095	0	
44	N49	4.735591	4.25	-2.734095	0	
45	1900MHZ-RRH_TOP_G	4.735591	.75	-2.734095	0	
46	800MHZ-RRH_TOP_G	4.735591	3.75	-2.734095	0	
47	1900MHZ-RRH_BOT_G	4.735591	-.75	-2.734095	0	
48	800MHZ-RRH_BOT_G	4.735591	2.25	-2.734095	0	
49	N59A	-4.735591	3	-2.734094	0	
50	N60A	-4.735591	0	-2.734094	0	
51	N61A	-4.735591	-1.25	-2.734094	0	
52	N62A	-4.735591	4.25	-2.734094	0	
53	1900MHZ-RRH_TOP_B	-4.735591	.75	-2.734094	0	
54	800MHZ-RRH_TOP_B	-4.735591	3.75	-2.734094	0	
55	1900MHZ-RRH_BOT_B	-4.735591	-.75	-2.734094	0	
56	800MHZ-RRH_BOT_B	-4.735591	2.25	-2.734094	0	
57	TD-RRH8X20_G	3.869565	1.5	-2.234095	0	
58	TD-RRH8X20_B	-3.869565	1.5	-2.234094	0	
59	N59B	3.999988	0	-3.464095	0	
60	N60B	3.999988	3	-3.464095	0	
61	N61B	-3.999988	0	-3.464095	0	
62	N62B	-3.999988	3	-3.464095	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
63	N63A	3.999988	5	-3.464095	0	
64	N64A	-3.999988	5	-3.464095	0	
65	N65	3.999988	-2	-3.464095	0	
66	N66	-3.999988	-2	-3.464095	0	
67	ET-X-TU-42-15-37-18-IR-SP_T...	-3.999988	4	-3.464095	0	
68	APXV9TM14-ALU-120_TOP_G	3.999988	4	-3.464095	0	
69	ET-X-TU-42-15-37-18-IR-SP_B...	-3.999988	-.5	-3.464095	0	
70	APXV9TM14-ALU-120_BOT_G	3.999988	-.5	-3.464095	0	
71	N71	-4.999988	0	-1.732044	0	
72	N72	-4.999988	3	-1.732044	0	
73	N73	-1.	0	5.196138	0	
74	N74	-1.	3	5.196138	0	
75	N75	-4.999988	5	-1.732044	0	
76	N76	-1.	5	5.196138	0	
77	N77	-4.999988	-2	-1.732044	0	
78	N78	-1.	-2	5.196138	0	
79	APXVSPP18-C-A20_TOP_B	-1	4	5.196139	0	
80	APXV9TM14-ALU-120_TOP_B	-4.999988	4	-1.732044	0	
81	APXVSPP18-C-A20_BOT_B	-1	-.5	5.196139	0	
82	APXV9TM14-ALU-120_BOT_B	-4.999988	-.5	-1.732044	0	
83	N83	1.	0	5.196138	0	
84	N84	1.	3	5.196138	0	
85	N85	4.999988	0	-1.732044	0	
86	N86	4.999988	3	-1.732044	0	
87	N87	1.	5	5.196138	0	
88	N88	4.999988	5	-1.732044	0	
89	N89	1.	-2	5.196138	0	
90	N90	4.999988	-2	-1.732044	0	
91	APXVSPP18-C-A20_TOP_A	4.999988	4	-1.732044	0	
92	APXV9TM14-ALU-120_TOP_A	1	4	5.196139	0	
93	APXVSPP18-C-A20_BOT_A	4.999988	-.5	-1.732044	0	
94	APXV9TM14-ALU-120_BOT_A	1	-.5	5.196139	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N18	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N19	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
3	N35	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
4	N36	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
5	N59	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
6	N60	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	

Joint Loads and Enforced Displacements (BLC 1 : DL)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
1	1900MHZ-RRH_TOP_A	L	Y	-30
2	800MHZ-RRH_TOP_A	L	Y	-32
3	TD-RRH8X20_A	L	Y	-70
4	1900MHZ-RRH_BOT_A	L	Y	-30
5	800MHZ-RRH_BOT_A	L	Y	-32
6	1900MHZ-RRH_TOP_G	L	Y	-30
7	800MHZ-RRH_TOP_G	L	Y	-32
8	1900MHZ-RRH_BOT_G	L	Y	-30
9	800MHZ-RRH_BOT_G	L	Y	-32
10	1900MHZ-RRH_TOP_B	L	Y	-30

Joint Loads and Enforced Displacements (BLC 1 : DL) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
11	800MHZ-RRH_TOP_B	L	Y	-32
12	1900MHZ-RRH_BOT_B	L	Y	-30
13	800MHZ-RRH_BOT_B	L	Y	-32
14	TD-RRH8X20_G	L	Y	-70
15	TD-RRH8X20_B	L	Y	-70
16	APXV9TM14-ALU-120_TOP_G	L	Y	-27.5
17	APXV9TM14-ALU-120_BOT_G	L	Y	-27.5
18	ET-X-TU-42-15-37-18-IR-SP_TOP_G	L	Y	-25
19	ET-X-TU-42-15-37-18-IR-SP_BOT_G	L	Y	-25
20	APXVSPP18-C-A20_TOP_B	L	Y	-28.5
21	APXV9TM14-ALU-120_TOP_B	L	Y	-27.5
22	APXVSPP18-C-A20_BOT_B	L	Y	-28.5
23	APXV9TM14-ALU-120_BOT_B	L	Y	-27.5
24	APXVSPP18-C-A20_TOP_A	L	Y	-28.5
25	APXV9TM14-ALU-120_TOP_A	L	Y	-27.5
26	APXVSPP18-C-A20_BOT_A	L	Y	-28.5
27	APXV9TM14-ALU-120_BOT_A	L	Y	-27.5

Joint Loads and Enforced Displacements (BLC 2 : WLz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
1	1900MHZ-RRH_TOP_A	L	Z	-58.7
2	800MHZ-RRH_TOP_A	L	Z	-52
3	TD-RRH8X20_A	L	Z	-204.6
4	1900MHZ-RRH_BOT_A	L	Z	-58.7
5	800MHZ-RRH_BOT_A	L	Z	-52
6	1900MHZ-RRH_TOP_G	L	Z	-58.7
7	800MHZ-RRH_TOP_G	L	Z	-52
8	1900MHZ-RRH_BOT_G	L	Z	-58.7
9	800MHZ-RRH_BOT_G	L	Z	-52
10	1900MHZ-RRH_TOP_B	L	Z	-58.7
11	800MHZ-RRH_TOP_B	L	Z	-52
12	1900MHZ-RRH_BOT_B	L	Z	-58.7
13	800MHZ-RRH_BOT_B	L	Z	-52
14	TD-RRH8X20_G	L	Z	-204.6
15	TD-RRH8X20_B	L	Z	-204.6
16	APXV9TM14-ALU-120_TOP_G	L	Z	-160.4
17	APXV9TM14-ALU-120_BOT_G	L	Z	-160.4
18	ET-X-TU-42-15-37-18-IR-SP_TOP_G	L	Z	-184.1
19	ET-X-TU-42-15-37-18-IR-SP_BOT_G	L	Z	-184.1
20	APXVSPP18-C-A20_TOP_B	L	Z	-204.1
21	APXV9TM14-ALU-120_TOP_B	L	Z	-160.4
22	APXVSPP18-C-A20_BOT_B	L	Z	-204.1
23	APXV9TM14-ALU-120_BOT_B	L	Z	-160.4
24	APXVSPP18-C-A20_TOP_A	L	Z	-204.1
25	APXV9TM14-ALU-120_TOP_A	L	Z	-160.4
26	APXVSPP18-C-A20_BOT_A	L	Z	-204.1
27	APXV9TM14-ALU-120_BOT_A	L	Z	-160.4

Joint Loads and Enforced Displacements (BLC 3 : WLx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
1	1900MHZ-RRH_TOP_A	L	X	-58.7
2	800MHZ-RRH_TOP_A	L	X	-52
3	TD-RRH8X20_A	L	X	-204.6
4	1900MHZ-RRH_BOT_A	L	X	-58.7
5	800MHZ-RRH_BOT_A	L	X	-52
6	1900MHZ-RRH_TOP_G	L	X	-58.7

Joint Loads and Enforced Displacements (BLC 3 : WLx) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
7	800MHZ-RRH_TOP_G	L	X	-52
8	1900MHZ-RRH_BOT_G	L	X	-58.7
9	800MHZ-RRH_BOT_G	L	X	-52
10	1900MHZ-RRH_TOP_B	L	X	-58.7
11	800MHZ-RRH_TOP_B	L	X	-52
12	1900MHZ-RRH_BOT_B	L	X	-58.7
13	800MHZ-RRH_BOT_B	L	X	-52
14	TD-RRH8X20_G	L	X	-204.6
15	TD-RRH8X20_B	L	X	-204.6
16	APXV9TM14-ALU-120_TOP_G	L	X	-160.4
17	APXV9TM14-ALU-120_BOT_G	L	X	-160.4
18	ET-X-TU-42-15-37-18-IR-SP_TOP_G	L	X	-184.1
19	ET-X-TU-42-15-37-18-IR-SP_BOT_G	L	X	-184.1
20	APXVSPP18-C-A20_TOP_B	L	X	-204.1
21	APXV9TM14-ALU-120_TOP_B	L	X	-160.4
22	APXVSPP18-C-A20_BOT_B	L	X	-204.1
23	APXV9TM14-ALU-120_BOT_B	L	X	-160.4
24	APXVSPP18-C-A20_TOP_A	L	X	-204.1
25	APXV9TM14-ALU-120_TOP_A	L	X	-160.4
26	APXVSPP18-C-A20_BOT_A	L	X	-204.1
27	APXV9TM14-ALU-120_BOT_A	L	X	-160.4

Member Distributed Loads (BLC 2 : WLz)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M73	PZ	-12	-12	0	0
2	ALPHA	PZ	-12	-12	0	0
3	BETA	PZ	-12	-12	0	0
4	GAMMA	PZ	-12	-12	0	0
5	M77	PZ	-12	-12	0	0
6	M78	PZ	-12	-12	0	0
7	M14	PZ	-12	-12	0	0
8	M15	PZ	-12	-12	0	0
9	M20	PZ	-12	-12	0	0
10	M21	PZ	-12	-12	0	0
11	M30	PZ	-12	-12	0	0
12	M31	PZ	-12	-12	0	0
13	M47	PZ	-9.8	-9.8	0	0
14	M56	PZ	-9.8	-9.8	0	0
15	M65	PZ	-9.8	-9.8	0	0
16	M16	PZ	-9.8	-9.8	0	0
17	M22	PZ	-9.8	-9.8	0	0
18	M32	PZ	-9.8	-9.8	0	0

Member Distributed Loads (BLC 3 : WLx)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M73	PX	-12	-12	0	0
2	ALPHA	PX	-12	-12	0	0
3	BETA	PX	-12	-12	0	0
4	GAMMA	PX	-12	-12	0	0
5	M77	PX	-12	-12	0	0
6	M78	PX	-12	-12	0	0
7	M14	PX	-12	-12	0	0
8	M15	PX	-12	-12	0	0
9	M20	PX	-12	-12	0	0
10	M21	PX	-12	-12	0	0

Member Distributed Loads (BLC 3 : WLx) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
11	M30	PX	-12	-12	0	0
12	M31	PX	-12	-12	0	0
13	M47	PX	-9.8	-9.8	0	0
14	M56	PX	-9.8	-9.8	0	0
15	M65	PX	-9.8	-9.8	0	0
16	M16	PX	-9.8	-9.8	0	0
17	M22	PX	-9.8	-9.8	0	0
18	M32	PX	-9.8	-9.8	0	0

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
No Data to Print ...						

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	DL	DL		-1		27				
2	WLz	WLZ				27		18		
3	WLx	WLX				27		18		
4	LL1	LL					1			
5	LL2	None					1			

Load Combinations

	Description	Sol..	PDelta	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
1	1.4DL	Yes	Y		DL	1.4														
2	1.2DL+1.6WLz	Yes	Y		DL	1.2	WLZ	1.6												
3	1.2DL-1.6WLz	Yes	Y		DL	1.2	WLZ	-1.6												
4	1.2DL+1.6WLx	Yes	Y		DL	1.2	W...	1.6												
5	1.2DL-1.6WLx	Yes	Y		DL	1.2	W...	-1.6												
6	1.2DL+1.6(0.75WLz+0.75WLx)	Yes	Y		DL	1.2	WLZ	1.2	W...	1.2										
7	1.2DL+1.6(0.75WLz-0.75WLx)	Yes	Y		DL	1.2	WLZ	1.2	W...	-1.2										
8	1.2DL-1.6(0.75WLz-0.75WLx)	Yes	Y		DL	1.2	WLZ	-1.2	W...	1.2										
9	1.2DL-1.6(0.75WLz+0.75WLx)	Yes	Y		DL	1.2	WLZ	-1.2	W...	-1.2										
10	1.2DL+1.5LLend	Yes	Y		DL	1.2	LL	1.5												
11	1.2DL+1.5LLmid	Yes	Y		DL	1.2	5	1.5												
12	1.2DL+1.5LL+10%1.6WLz	Yes	Y		DL	1.2	LL	1.5	WLZ	.16										
13	1.2DL+1.5LL-10%1.6WLz	Yes	Y		DL	1.2	LL	1.5	WLZ	-.16										
14	1.2DL+1.5LL+10%1.6WLx	Yes	Y		DL	1.2	LL	1.5	W...	.16										
15	1.2DL+1.5LL-10%1.6WLx	Yes	Y		DL	1.2	LL	1.5	W...	-.16										
16	1.2DL+1.5LL+10%1.6(0.75WLz+...	Yes	Y		DL	1.2	LL	1.5	WLZ	.12	W...	.12								
17	1.2DL+1.5LL+10%1.6(0.75WLz-...	Yes	Y		DL	1.2	LL	1.5	WLZ	.12	W...	-.12								
18	1.2DL+1.5LL-10%1.6(0.75WLz-0...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.12	W...	.12								
19	1.2DL+1.5LL-10%1.6(0.75WLz+...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.12	W...	-.12								
20	1.2DL+1.5LL+10%1.6WLz	Yes	Y		DL	1.2	5	1.5	WLZ	.16										
21	1.2DL+1.5LL-10%1.6WLz	Yes	Y		DL	1.2	5	1.5	WLZ	-.16										
22	1.2DL+1.5LL+10%1.6WLx	Yes	Y		DL	1.2	5	1.5	W...	.16										
23	1.2DL+1.5LL-10%1.6WLx	Yes	Y		DL	1.2	5	1.5	W...	-.16										
24	1.2DL+1.5LL+10%1.6(0.75WLz+...	Yes	Y		DL	1.2	5	1.5	WLZ	.12	W...	.12								
25	1.2DL+1.5LL+10%1.6(0.75WLz-...	Yes	Y		DL	1.2	5	1.5	WLZ	.12	W...	-.12								
26	1.2DL+1.5LL-10%1.6(0.75WLz-0...	Yes	Y		DL	1.2	5	1.5	WLZ	-.12	W...	.12								
27	1.2DL+1.5LL-10%1.6(0.75WLz+...	Yes	Y		DL	1.2	5	1.5	WLZ	-.12	W...	-.12								
28	DL		Y		DL	1														
29	WLz		Y		WLZ	1														

Load Combinations (Continued)

	Description	Sol..	PDelta	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
30	WLx		Y		W...	1																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N18	max	311.679	4	488.617	13	2341.444	2	-338.028	2	606.694	4	26.601	5
2		min	-311.608	5	303.645	2	-1530.232	3	-531.851	12	-606.379	5	-26.576	4
3	N19	max	314.276	4	490.72	13	1809.99	2	-333.041	2	606.931	4	25.879	4
4		min	-314.3	5	314.822	2	-2619.989	3	-532.641	13	-606.75	5	-25.854	5
5	N35	max	2044.634	8	369.695	1	920.646	7	198.066	1	334.945	3	343.066	1
6		min	-1342.579	7	303.081	8	-1308.932	8	146.04	9	-329.71	2	279.921	6
7	N36	max	1594.303	8	370.797	1	1468.491	7	198.124	1	336.634	3	343.166	1
8		min	-2286.994	7	314.561	8	-1048.841	8	146.416	6	-331.448	2	279.966	3
9	N59	max	1350.992	6	404.852	24	913.26	6	220.344	25	269.728	6	-277.05	7
10		min	-2039.084	9	300.253	9	-1297.312	9	144.382	8	-271.393	3	-379.896	26
11	N60	max	2281.827	6	405.248	24	1452.254	6	220.386	26	269.085	6	-277.103	3
12		min	-1601.25	9	311.681	9	-1044.093	9	144.254	7	-272.02	3	-380.06	20
13	Totals:	max	7021.167	4	2274.127	17	7082.903	2						
14		min	-7021.167	5	1899.127	3	-7082.903	3						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M47	PIPE_2.0	.159	3	13	.020	3		18	30698.0...	32130	1871.625	1871.625	1....	H1-1b
2	M56	PIPE_2.0	.106	3	9	.015	3		7	30698.0...	32130	1871.625	1871.625	2....	H1-1b
3	M65	PIPE_2.0	.121	3	24	.016	3		24	30698.0...	32130	1871.625	1871.625	2....	H1-1b
4	M73	PIPE_2.0	.587	6.75	9	.073	12		9	6830.998	32130	1871.625	1871.625	3	H1-1b
5	ALPHA	PIPE_2.0	.607	6.875	9	.124	12		9	6830.998	32130	1871.625	1871.625	3	H1-1b
6	BETA	PIPE_2.0	.606	5	8	.128	0		8	6830.998	32130	1871.625	1871.625	3	H1-1b
7	GAMMA	PIPE_2.0	.621	5.625	2	.116	0		2	6830.998	32130	1871.625	1871.625	3	H1-1b
8	M77	PIPE_2.0	.587	5.125	8	.074	0		8	6830.998	32130	1871.625	1871.625	3	H1-1b
9	M78	PIPE_2.0	.603	5.75	2	.070	0		2	6830.998	32130	1871.625	1871.625	3	H1-1b
10	M14	PIPE_2.0	.378	0	5	.066	2.813		4	20866.7...	32130	1871.625	1871.625	3	H1-1b
11	M15	PIPE_2.0	.381	0	4	.062	0		5	20866.7...	32130	1871.625	1871.625	3	H1-1b
12	M16	PIPE_2.0	.156	3	12	.020	3		12	30698.0...	32130	1871.625	1871.625	2....	H1-1b
13	M17	PIPE_2.0	.347	0	13	.046	0		13	30698.0...	32130	1871.625	1871.625	1....	H1-1b
14	M20	PIPE_2.0	.310	.375	7	.068	2.812		9	20866.7...	32130	1871.625	1871.625	3	H1-1b
15	M21	PIPE_2.0	.321	.375	8	.064	2.812		6	20866.7...	32130	1871.625	1871.625	3	H1-1b
16	M22	PIPE_2.0	.115	3	1	.015	0		7	30698.0...	32130	1871.625	1871.625	2....	H1-1b
17	M23	PIPE_2.0	.270	0	7	.045	1.5		7	30698.0...	32130	1871.625	1871.625	2....	H1-1b
18	M30	PIPE_2.0	.296	.375	6	.067	2.812		8	20866.7...	32130	1871.625	1871.625	3	H1-1b
19	M31	PIPE_2.0	.306	.375	9	.063	2.812		7	20866.7...	32130	1871.625	1871.625	3	H1-1b
20	M32	PIPE_2.0	.128	0	24	.017	0		24	30698.0...	32130	1871.625	1871.625	2....	H1-1b
21	M33	PIPE_2.0	.282	0	24	.045	0		6	30698.0...	32130	1871.625	1871.625	2....	H1-1b
22	M42	PIPE_2.0	.254	1.26	13	.034	3.552		12	22356.0...	32130	1871.625	1871.625	1....	H1-1b
23	M24	PIPE_2.0	.175	1.26	7	.028	1.26		7	22356.0...	32130	1871.625	1871.625	1....	H1-1b
24	M26	PIPE_2.0	.200	1.26	24	.028	1.26		6	22356.0...	32130	1871.625	1871.625	1....	H1-1b
25	M25	PIPE_2.0	.163	1.969	7	.032	1.021		7	17855.0...	32130	1871.625	1871.625	1....	H1-1b
26	M26A	PIPE_2.0	.142	1.969	6	.029	2.042		2	17855.0...	32130	1871.625	1871.625	2....	H1-1b
27	M27	PIPE_2.0	.277	4.958	21	.040	2.042		22	17855.0...	32130	1871.625	1871.625	3	H1-1b
28	M28	PIPE_2.0	.278	4.958	24	.040	2.042		26	17855.0...	32130	1871.625	1871.625	3	H1-1b
29	M29	PIPE_2.0	.181	1.969	9	.036	1.021		9	17855.0...	32130	1871.625	1871.625	1....	H1-1b
30	M30A	PIPE_2.0	.142	1.969	9	.030	2.042		9	17855.0...	32130	1871.625	1871.625	1....	H1-1b

Sprint®

PROJECT: 2.5 EQUIPMENT DEPLOYMENT

SITE NAME: CITADEL/GROTON

SITE CASCADE: CT33XC584-C

SITE ADDRESS: 99 BRIAR HILL ROAD
GROTON, CT 06340

SITE TYPE: 250'-0' GUYED TOWER

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

RAMAKER & ASSOCIATES, INC.
1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999
www.Ramaker.com

Transcend Wireless
48 SPRUCE STREET
OAKLAND, NJ 07346

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/15/2015

SITE INFORMATION

PROPERTY OWNER:
CITADEL BROADCASTING CO
7 GOVERNOR WINTHROP BLVD
NEW LONDON, CT 06320

SITE ADDRESS:
99 BRIAR HILL ROAD
GROTON, CT 06430
NEW LONDON COUNTY

GEOGRAPHIC COORDINATES:
LATITUDE: 41° 23' 6.216" (41.38506)
LONGITUDE: 72° 4' 13.08" (72.0703)

ZONING JURISDICTION:
NEW LONDON COUNTY

ZONING DISTRICT:
RU-20

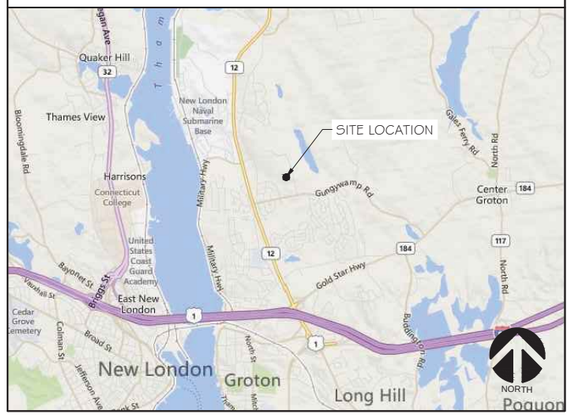
POWER COMPANY:
CONN. LIGHT AND POWER
PH.: (800) 266-2000

SPRINT CONSTRUCTION MANAGER:
NAME: MIKE DELIA
PHONE: (781) 316-6348
E-MAIL: michael.delia@sprint.com

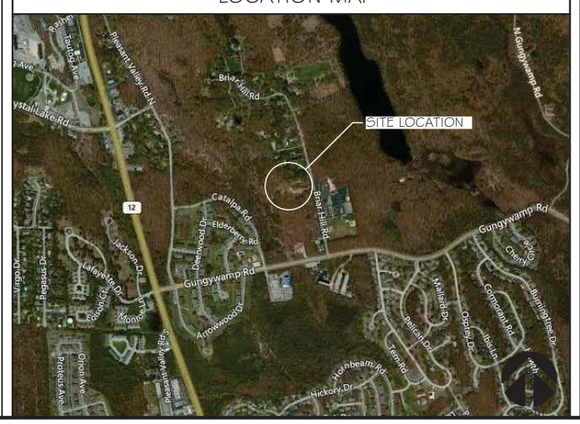
EQUIPMENT SUPPLIER:
ALCATEL-LUCENT
600-700 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974
PH.: (908) 508-8080

PLANS PREPARED BY:
RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK, PROJECT MANAGER
PH.: (608) 643-4100
EMAIL: kbohnsack@ramaker.com

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

- REMOVE AND REPLACE EXISTING BTS CABINET WITH NEW 9928 MM-BTS CABINET AND 9929 GROWTH CABINET
- REMOVE AND REPLACE EXISTING BATTERY CABINET
- INSTALL NEW FIBER DISTRIBUTION BOX
- REMOVE AND REPLACE (6) EXISTING ANTENNAS WITH (6) NEW NV # 2.5 ANTENNAS ON TOWER
- INSTALL (6) NV # (3) 2.5 RRH'S ON TOWER
- INSTALL (4) NV # 2.5 HYBRID CABLES WITH (9) RET/JUMPER CABLES
- REMOVE AND REPLACE (1) EXISTING GPS ANTENNA ON TOWER

APPLICABLE CODES

* ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

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SHEET INDEX

SHT NO:	SHEET TITLE:	REV:	ENGINEER:
T-1	TITLE SHEET	A	JRS
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SP-2	SPRINT SPECIFICATIONS	A	JRS
SP-3	SPRINT SPECIFICATIONS	A	JRS
A-1	SITE PLAN	A	JRS
A-2	EQUIPMENT PLAN	A	JRS
A-3	ELEVATION & ANTENNA DETAILS	A	JRS
A-4	NETWORK VISION RF DATA SHEET	A	JRS
A-5	2.5 RF DATA SHEET	A	JRS
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A-7	FIBER PLUMBING DIAGRAM	A	JRS
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A-11	EQUIPMENT DETAILS	A	JRS
A-12	9928 BTS & BATTERY SPECS	A	JRS
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E-1	EQUIPMENT UTILITY & GROUNDING PLAN	A	JRS
E-2	GROUNDING DETAILS	A	JRS
E-3	DC POWER DETAILS & PANEL SCHEDULES	A	JRS

MARK	DATE	DESCRIPTION
A	01/15/15	FINAL CDs ISSUED

ISSUE PHASE: FINAL DATE ISSUED: 01/15/2015

PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
TITLE SHEET

SCALE: NONE

PROJECT NUMBER: 29461
SHEET NUMBER: T-1

I:\29400\29461\CAD\29461 Sprnt 2.5 CD for CT.dwg Printed by: tnelson on Jan 15, 2015 - 11:05am

DRAWN BY: KJG CHECKED BY: KAB

SECTION 01 100 - SCOPE OF WORK

THE WORK:
THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE CONSTRUCTION DRAWINGS AND ASSOCIATED OUTLINE SPECIFICATIONS AND THE SITE SPECIFIC WORK ORDER, DESCRIBE THE WORK TO BE PERFORMED BY THIS CONSTRUCTION CONTRACTOR (SUPPLIER).

RELATED DOCUMENTS:
A. THE REQUIREMENTS OF EACH SECTION OF THIS SPECIFICATION APPLY TO ALL SECTIONS, INDIVIDUALLY AND COLLECTIVELY.
B. RELATED DOCUMENTS: THE CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT VERSION OF THE FOLLOWING SUPPLEMENTAL REQUIREMENTS FOR INSTALLATION AND TESTING.
   1. EN-2012-001: (FIBER OPTIC, DC CABLE, AND DC CIRCUIT BREAKER TAGGING STANDARDS)
   2. TS-0200 - (TRANSMISSION ANTENNA LINE ACCEPTANCE STANDARDS)
   3. EL-0568: (FIBER TESTING POLICY)
   4. NP-312-201: (EXTERIOR GROUNDING SYSTEM TESTING)
   5. NP-760-500: ETHERNET, MICROWAVE, TESTING AND ACCEPTANCE

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

NATIONALLY RECOGNIZED CODES AND STANDARDS:
THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
D. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
G. AMERICAN CONCRETE INSTITUTE (ACI)
H. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
I. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
J. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
K. PORTLAND CEMENT ASSOCIATION (PCA)
L. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
M. BRICK INDUSTRY ASSOCIATION (BIA)
N. AMERICAN WELDING SOCIETY (AWS)
O. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
P. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
Q. DOOR AND HARDWARE INSTITUTE (DHI)
R. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
S. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

DEFINITIONS:
A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: "SPRINT"; SPRINT NEXTEL CORPORATION AND IT'S OPERATING ENTITIES.
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR, SUPPLIER, CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. CONSTRUCTION MANAGER - ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

POINT OF CONTACT:
COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

ON-SITE SUPERVISION:
THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

DRAWINGS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
B. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

USE OF JOB SITE:
THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

UTILITY SERVICES:
WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

PERMITS/FEES:
WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR:
CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:
CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

TEMPORARY UTILITIES AND FACILITIES:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSOR'S OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

ACCESS TO WORK:
THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

DIMENSIONS:
VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

EXISTING CONDITIONS:
NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

FURNISHED MATERIALS:
COMPANY FURNISHED MATERIALS AND EQUIPMENT TO BE INSTALLED BY THE CONTRACTOR (OFIC) IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

RECEIPT OF MATERIAL AND EQUIPMENT:
A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
   1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
   2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
   3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
B. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
C. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
D. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

DELIVERABLES:
A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S ISSUANCE OF THE WORK ORDER.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

GENERAL REQUIREMENTS FOR CONSTRUCTION:
A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
   1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
   2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

FUNCTIONAL REQUIREMENTS:
A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. CONTRACTOR SHALL TAKE ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
   2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
   3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND BACKHAUL (FIBER, COPPER, OR MICROWAVE).
   4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
   5. INSTALL ABOVE GROUND GROUNDING SYSTEMS, CONDUIT AND BOXES.
   6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
   7. INSTALL "H-FRAMES", CABINETS AND PADS AND PLATFORMS AS INDICATED.
   8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
   9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
   10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
   11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
   12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
   13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
   14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
   15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
   16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
   17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
   18. CONDUCT ALL REQUIRED TESTS AND INSPECTIONS
   19. PERFORM, DOCUMENT, AND CLOSE OUT ALL JURISDICTIONAL PERMITTING REQUIREMENTS AND ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
   20. PERFORM ALL ADDITIONAL WORK AS IDENTIFIED IN SCOPE OF SERVICES ATTACHED TO THE SUPPLIER AGREEMENT FOR THIS PROJECT. THIS WORK MAY INCLUDE COMMISSIONING, INTEGRATION, SPECIAL WAREHOUSING, REVERSE LOGISTICS ACTIVITIES, ETC. PERFORM COMMISSIONING AND INTEGRATION ACTIVITIES PER APPLICABLE MOPS.

DELIVERABLES:
A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEST REPORTS AND DOCUMENTATION INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
   1. PRODUCT SPECIFICATIONS FOR MATERIALS OR SPECIAL CONSTRUCTION IF REQUESTED BY SPRINT
   2. ACTUALIZE ALL CONSTRUCTION RELATED MILESTONES IN SITERRA AND COMPLETE ALL ON-LINE FORMS AND COMPLETE DOCUMENT UP-LOADS. UPLOAD ALL REQUIRED CLOSEOUT DOCUMENTS AND FINAL SITE PHOTOS
   3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT LEFT ON SITE INSIDE BASE OF MAIN RF CABINET IN A PROTECTIVE POUCH.
   4. ALL REQUIRED TEST REPORTS.
   5. REQUIRED CLOSEOUT DOCUMENTATION INCLUDING BUT NOT LIMITED TO:
      a. ALL JURISDICTIONAL PERMITTING AND OCCUPANCY INFORMATION
      b. PDF SCAN OF REDLINES PRODUCED IN THE FIELD
      c. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS
      d. LIEN WAIVERS
      e. FINAL PAYMENT APPLICATION
      f. REQUIRED FINAL CONSTRUCTION PHOTOS
      g. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
      h. LISTS OF SUBCONTRACTORS
B. PROVIDE ADDITIONAL DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
   1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
   2. PROJECT PROGRESS REPORTS.
   3. PRE-CONSTRUCTION MEETING NOTES.

SECTION 01 400 - TESTS, INSPECTIONS, SUBMITTALS, AND PROJECT CLOSEOUT

TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. COAX SWEEPS AND FIBER TESTS PER TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS
   2. POST CONSTRUCTION HEIGHT VERIFICATION, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
   3. CONCRETE BREAK TESTS
   4. SITE RESISTANCE TO EARTH TEST
   5. STRUCTURAL BACKFILL COMPACTION TESTS
   6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
   7. ADDITIONAL TESTING AS REQUIRED ELSEWHERE IN THIS SPECIFICATION.

SUBMITTALS:
A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.
B. UPLOAD THE FOLLOWING TO SITERRA AS APPLICABLE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
   2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
   3. CHEMICAL GROUNDING SYSTEM .
   4. REINFORCEMENT CERTIFICATIONS
   5. STRUCTURAL BACKFILL TEST RESULTS
   6. SWEEP AND FIBER TESTS
   7. ANTENNA AZIMUTH AND DOWN-TILT VERIFICATION
   8. POST CONSTRUCTION HEIGHT VERIFICATION
   9. ADDITIONAL SUBMITTALS MAY BE REQUIRED FOR SPECIAL CONSTRUCTION OR MINOR MATERIALS
C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

TESTING BY THIRD PARTY AGENCY:
A. EMPLOY AN AGENCY OF ENGINEERS AND SCIENTISTS WHO IS REGULARLY ENGAGED IN FIELD AND LABORATORY TESTING AND ANALYSIS. AGENCY SHALL HAVE BEEN IN BUSINESS A MINIMUM OF FIVE YEARS, AND BE LICENSED AS PROFESSIONAL ENGINEERS IN THE STATE WHERE THE PROJECT IS LOCATED. AGENCY IS SUBJECT TO APPROVAL BY COMPANY.
   1. AGENCY MUST HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
   2. AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
   3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B. REQUIRED THIRD PARTY TESTS:
   1. SITE RESISTANCE TO EARTH TEST PER NP-312-201
   2. CONCRETE CYLINDER BREAK TESTS FOR TOWER PIER AND ANCHORS PER NATIONALLY RECOGNIZED STANDARDS
   3. STRUCTURAL SOILS COMPACTION TESTS PER NATIONALLY RECOGNIZED STANDARDS
   4. REBAR PLACEMENT VERIFICATION WITH REPORT
   5. TESTING TENSION STUDY FOR ROCK ANCHORS
   6. ALL THIRD PARTY TESTS AS REQUIRED BY LOCAL JURISDICTION
C. REQUIRED TESTS BY CONTRACTOR
   1. COAX SWEEP TESTS PER SPRINT STANDARD TS-0200
   2. FIBER TESTS PER SPRINT STANDARD EL-0568
   3. MICROWAVE LINK TESTS PER NP-760-500
   4. ANTENNA AZIMUTHS AND DOWN TILT USING ELECTRONIC ALIGNMENT TOOL PER ANTENNA INSTALLATION SPECIFICATION HEREIN.

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Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/15/2015

MARK	DATE	DESCRIPTION
A	01/15/15	FINAL CDs ISSUED

ISSUE PHASE: FINAL
DATE ISSUED: 01/15/2015

PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 29461
SHEET NUMBER: SP-1

DRAWN BY: KJG CHECKED BY: KAB

5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN THE TOWER INSTALLATION SPECIFICATIONS.
6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HEREWITH IN THE ASPHALT PAVING SPECIFICATIONS.
7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HEREWITH IN THE CONCRETE PAVING SPECIFICATIONS.
8. TESTING REQUIRED HEREWITH UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION

D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING

E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.
1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE, PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FILTERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

PROJECT CLOSEOUT:

A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK / REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.

B. CLOSEOUT DOCUMENTATION: ALL CLOSEOUT DOCUMENTATION AND PHOTOGRAPHS SHALL BE UPLOADED PRIOR TO FINAL ACCEPTANCE. SPRINT WILL REVIEW CLOSEOUT DOCUMENTATION FOR PRESENCE AND CONTENT. CLOSEOUT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING AS APPLICABLE:
1. COAX SWEEP TESTS:
2. FIBER TESTS:
3. JURISDICTION FINAL INSPECTION DOCUMENTATION
4. REINFORCEMENT CERTIFICATION (MILL CERTIFICATION)
5. CONCRETE MIX DESIGN AND PRODUCT DATA (TOWER FOUNDATION)
6. LIEN WAIVERS AND RELEASES.
7. POST -CONSTRUCTION HEIGHT VERIFICATION
8. JURISDICTION CERTIFICATE OF OCCUPANCY
9. ELECTRONIC ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
10. STRUCTURAL BACKFILL TEST RESULTS (IF APPLICABLE)
11. CELL SITE UTILITY SETUP
12. AS-BUILT REDLINE CONSTRUCTION DRAWINGS (PDF SCAN OF FIELD MARKS)
13. AS-BUILT CONSTRUCTION DRAWINGS IN DWG AND PDF FORMATS
14. LIST OF SUB CONTRACTORS
15. APPROVED PERMITTING DOCUMENTS
16. FINAL SITE PHOTOS UP-LOADED TO SITERRA. INCLUDE THE FOLLOWING AS APPLICABLE:
    a. TOWER, ANTENNAS, RRUS, AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX/CABLE LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
    b. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
    c. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
    d. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

PROJECT PHOTOGRAPHS:

A. PROVIDE PROJECT CLOSEOUT GENERAL ARRANGEMENT PHOTOS OF ALL NEW WORK. THE FOLLOWING LIST REFRESENTS MINIMUM REQUIREMENTS AND MINIMUM QUANTITY. ADDITIONAL PHOTOS MAY BE REQUIRED TO ADEQUATELY DOCUMENT THE WORK.
1. ASR AND RF MPE SIGNAGE (IF NOT IN PLACE, SUPPLIER NOTIFIES EMS FIELD REPRESENTATIVE)
2. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR)
3. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR) CLOSE UP SHOWING WEATHERPROOFING AND GROUNDING (AS REQUIRED). CLOSE-UP OF BACK SIDE OF EACH PERMANENT RRU SHOWING SERIAL NUMBER/BAR CODE.
4. VIEW (1 EACH SECTOR) ALONG THE AZIMUTH AND TILT OF THE ANTENNAS
5. TOP OF TOWER FROM GROUND, 1 EACH SECTOR
6. MAINLINE HYBRID CABLE ROUTE DOWN TOWER SHOWING FASTENERS AND SUPPORT
7. MAINLINE/HYBRID CABLE ROUTE ALONG ICE BRIDGE OR IN CABLE TRAY SHOWING FASTENERS AND SUPPORT
8. GROUND MOUNTED RRU RACKS (FRONT AND BACK)
9. FRONT, SIDE AND BACK ELEVATIONS OF ALL GROUND CABINETS
10. VIEW OF COMPOUND FROM A DISTANCE
11. VIEW OF EACH GROUND CABINET (POWER, RF, FIBER SPOOL, PPC POWER, PPC TELCO WITH DOOR OPEN)
12. BACKHAUL FIBER MEET-ME-POINT AND CONDUIT ROUTE (MICROWAVE INSTALLATION IF NOT FIBER)
13. AAV NETWORK INTERFACE DEVICE OR MICROWAVE RADIO INSTALLATION

DEFICIENCY CORRECTIONS:

CONTRACTOR IS RESPONSIBLE FOR ALL CORRECTIONS TO DEFICIENCIES IDENTIFIED THROUGH TESTING, REVIEW OF SUBMITTALS, INSPECTIONS AND CLOSEOUT REVIEWS.

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:

A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.

B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINTS LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

PROJECT CONFERENCE CALLS:

SPRINT MAY HOLD PERIODIC PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

FINAL PROJECT ACCEPTANCE: PRIOR TO SPRINTS FINAL PROJECT ACCEPTANCE. ALL REQUIRED MILESTONE ACTUALS MUST BE UPDATED IN SITERRA AND ALL REQUIRED REPORTING TASKS MUST BE COMPLETE.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:

HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN. LENGTH FOR JUMPER SHALL BE 10'-0".

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
    b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
    a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
    c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 (CURRENT VERSION).
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING

A. NEW DC CIRCUIT IS REQUIRED IN MMBS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED.

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS.

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

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Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/15/2015

MARK	DATE	DESCRIPTION
A	01/15/15	FINAL CDs ISSUED

ISSUE PHASE: FINAL
DATE ISSUED: 01/15/2015

PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 29461
SHEET NUMBER: SP-2

DRAWN BY: KJG CHECKED BY: KAB

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT

1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.

2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO-OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/15/2015

MARK	DATE	DESCRIPTION
A	01/15/15	FINAL CDs ISSUED

ISSUE PHASE: FINAL
DATE ISSUED: 01/15/2015

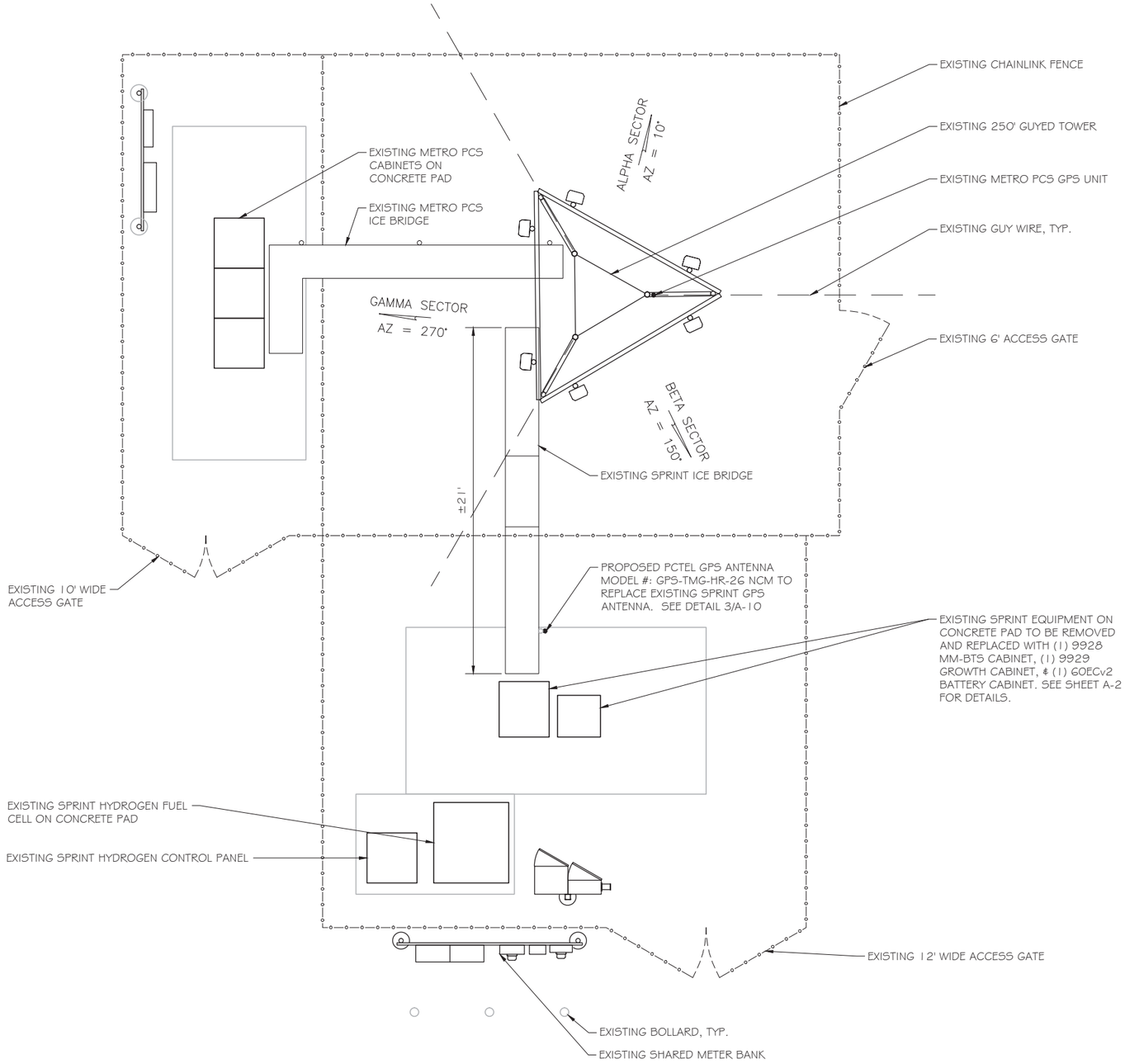
PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 29461
SHEET NUMBER: SP-3



SITE PLAN
SCALE: 1" = 7.5'

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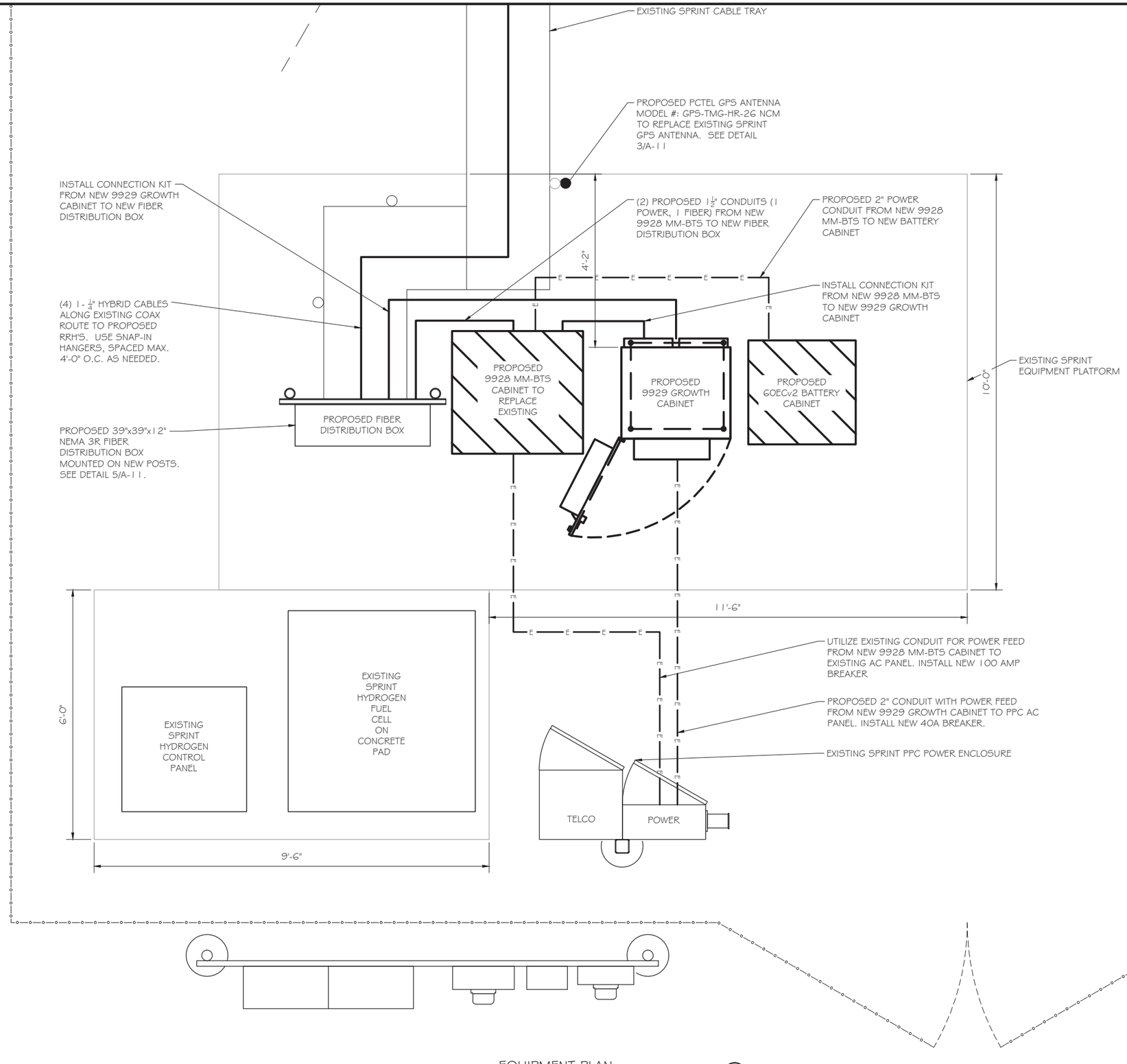
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
SITE PLAN

0 3.75' 7.5' 15'
11" x 17" - 1" = 7.5'
22" x 34" - 1" = 3.75'

PROJECT NUMBER: 29461
SHEET NUMBER: A-1



EQUIPMENT PLAN
SCALE: 1" = 2.5'

1

NORTH

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DATE ISSUED: 01/15/2015

PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

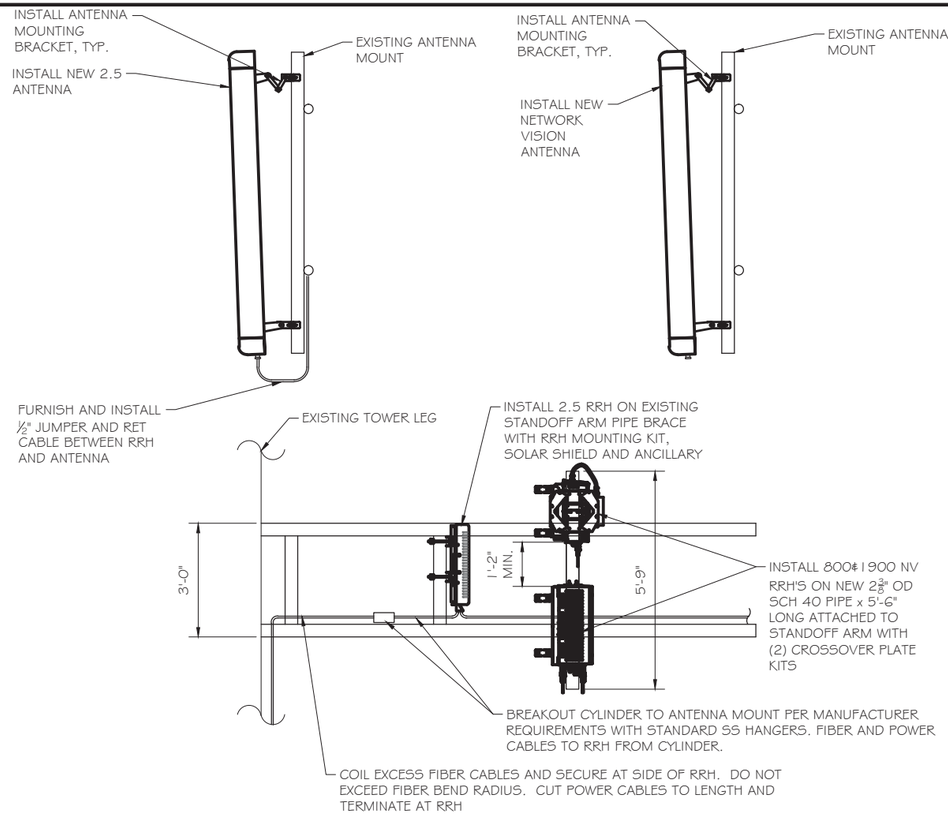
PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
EQUIPMENT PLAN

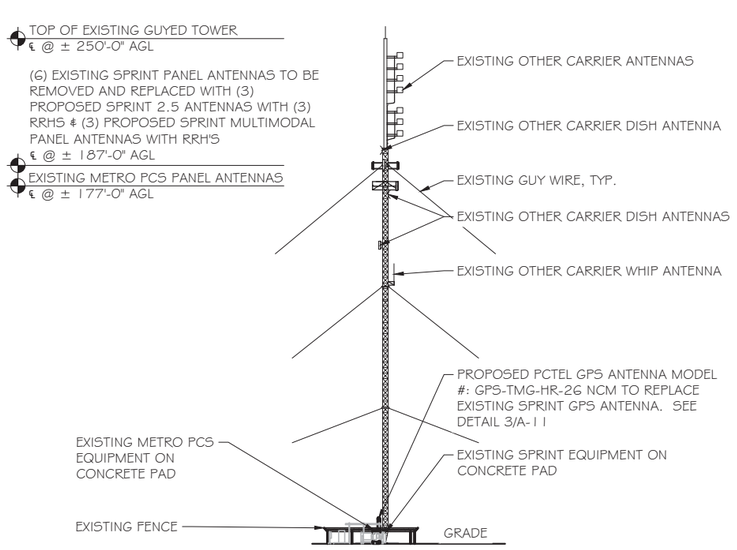
0 1.25' 2.5' 5'
11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

PROJECT NUMBER: 29461
SHEET NUMBER: A-2

I:\29400\29461\CAD\29461 Sprnt 2.5 CD for CT.dwg Printed by: tnelson on Jan 15, 2015 - 11:05am



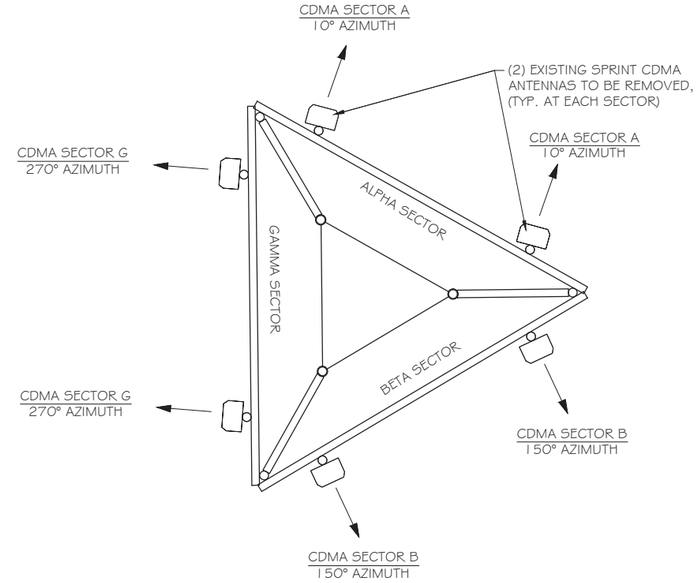
ANTENNA & RRH MOUNTING DETAILS (1)
SCALE: NTS



BUILDING ELEVATION (2)
SCALE: 1" = 75'

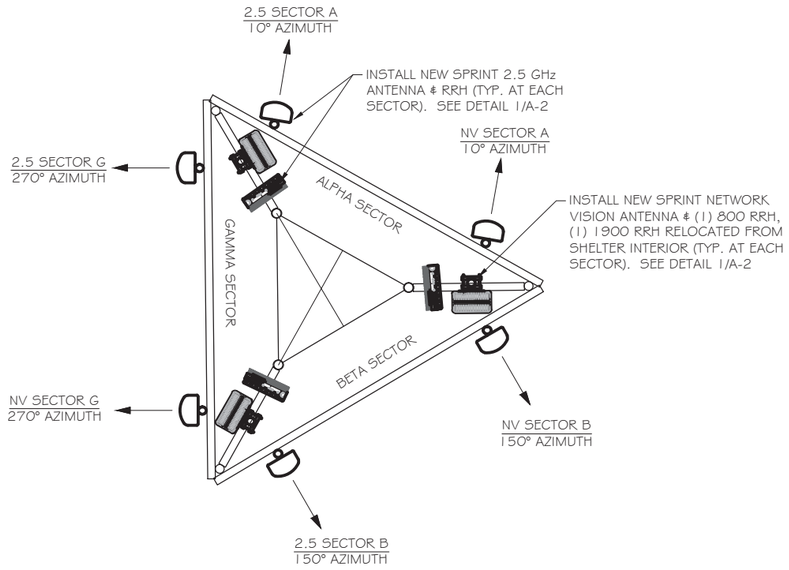
0 37.5' 75' 150'

11"x17" - 1" = 75'
22"x34" - 1" = 37.5'



NORTH

EXISTING ANTENNA ARRAY (3)
SCALE: NTS



NORTH

PROPOSED ANTENNA ARRAY (4)
SCALE: NTS

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DATE ISSUED: 01/15/2015

PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
ELEVATIONS & ANTENNA DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-3

	Market	Northern Connecticut		
	Cascade ID	CT33XC584		
		Sector 1	Sector 2	Sector 3
1900	1900MHz_Azimuth	10	150	270
	1900MHz_No_of_Antennas	1	1	1
	1900MHz_RADCenter(ft)	187	187	187
	1900MHz_Antenna Make	RFS	RFS	KMW
	1900MHz_Antenna Model	APXVSPP18-C-A20	APXVSPP18-C-A20	ET-XU-42-15-37-18
	1900MHz_Horizontal_Beamwidth	65	65	37
	1900MHz_Vertical_Beamwidth	5.5	5.5	8
	1900MHz_AntennaHeight (ft)	6	6	4
	1900MHz_AntennaGain(dBd)	15.9	15.9	15.9
	1900MHz_E_Tilt	-1	-3	-2
	1900MHz _M_Tilt	0	0	0
	1900_Effective_Tilt	-1	-3	-2
	1900MHz_Carrier_Forecast_Year_2013	6	6	6
	1900MHz_RRH Manufacturer	ALU	ALU	ALU
	1900MHz_RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
	1900MHz_RRH Count	1	1	1
	1900MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	1900MHz Combiner Model	No Combiner Required	No Combiner Required	No Combiner Required
	1900MHz Power Split Ratio (Main/Split)			
	1900MHz Splitter Manufacturer			
	1900MHz Splitter Model			
	1900MHz Number of Splitters			
	1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for TT or Main Coax to Antenna for Ground Mount, ft)	10	10	10
	1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-Antenna for TT or Main Coax to Antenna for Ground Mount)	LCF12-50J	LCF12-50J	LCF12-50J
	1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)	N/A	N/A	N/A
	1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)	N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Length (ft)	N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Model	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Length (Ground based RRH to Combiner-OR-Main Coax, ft)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner-OR-Main Coax)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)	N/A	N/A	N/A
	800MHz_Azimuth	10	150	270
	800MHz_No_of_Antennas	0	0	0
	800MHz_RADCenter(ft)	187	187	187
	800MHz_AntennaMake	RFS	RFS	KMW
	800MHz_AntennaModel	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)	ET-XU-42-15-37-18 (Shared w/1900)
	800MHz_Horizontal_Beamwidth	65	65	42
	800MHz_Vertical_Beamwidth	11.5	11.5	18
	800MHz_AntennaHeight (ft)	6	6	4
	800MHz_AntennaGain (dBd)	13.4	13.4	12.9
	800MHz_E_Tilt	-1	-4	-4

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ISSUE PHASE: FINAL
DATE ISSUED: 01/15/2015

PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
NETWORK VISION
RF DATA SHEET

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-4

RFDS Sheet

General Site Information

Site ID	CT33XC584-C	Equipment Vendor	Alcatel-Lucent
Market	Southern Connecticut	Lattitude	41.38506
Region	Northeast	Longitude	-72.070306
MLA	N/A	LL SITE ID	N/A
Structure Type	GUYED TOWER		
BTS Type			

				Incremental Power Draw needed by added Equipment
Solution ID		Siterra SR Equipment type		
		Equipment Vendor	Alcatel-Lucent	N/A

Base Equipment

BBU Kit	ALU BBU Kit	Top Hat	None
BBU Kit Qty	1	Top Hat Qty	N/A
		Top Hat Dimenstions	N/A
Growth Cabinet	ALU Growth Cabinet 9929	Top Hat Weight (lbs)	N/A
Growth Cabinet Qty	1		
Growth Cabinet Dimensions	63.65" X 31.5" X 35.5"		
Growth Cabinet Weight	1600		

RF Path Information

RRH	TD-RRH8x20-25	
RRH Qty	3	
RRH Dimensions	26.1"x18.6"x6.7"	
RRH Weight. lbs.	70	
RRH Mount Weight. Lbs.	10	
Power and Fiber Cable	ALU HYBRID CABLE	
Cable Qty	1	
Weight per foot. Lbs.	0.992	
Diameter. Inches.	1.25	
Length Ft.	238	(calculated as coax run plus 20%)
Coax Jumper	8	
Coax Jumper Qty	27	
Coax Jumper Length. Feet.	8	
Coax Jumper Weight	1.7	
Coax Jumper Diameter. Inches	0.5	
AISG Cable	Commscope ATCB-B01-006	
AISG Cable Qty	3	
AISG Diameter. Inches.	0.315	
AISG Cable length.	8'	
Weight of entire AISG cable. Lbs.	1.3	

Antenna Sector Information

	Sector 1	Sector 2	Sector 3
Antenna make/model	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20
Antenna qty	1	1	1
Antenna Dimensions. Inches	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"
Antenna Weight. Lbs	55.12	55.12	55.12
Antenna Mounting Kit Weight. Lbs.	11.5	11.5	11.5
CL Height	187	187	187
Antenna Azimuth	10	150	270
Antenna Mechanical Downtilt	0	0	0
Antenna etilt	-2	-2	-2

*RFDS SHEET WAS GENERATED BY RAMAKER & ASSOCIATES FROM PLAN OF RECORD (POR) PROVIDED BY SPRINT. CONTRACTOR SHALL VERIFY AND OBTAIN FINAL RFDS FROM SPRINT CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.

NOTES:

1. GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND C/L HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT BELOW, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING CONTACT INFORMATION ABOVE FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5GHZ ANTENNA AT SAME C/L HEIGHT AS 1.9GHZ ANTENNA AND EMAIL CORRECT C/L HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT C/L HEIGHT. ALSO EMAIL CORRECT 1.9GHZ AND 800MHZ ANTENNA C/L HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
2. AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5GHZ. TEST TO INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
3. GENERAL CONTRACTOR MUST ENSURE THAT NO OBJECT IS LOCATED WITHIN 45 DEGREES OF LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5GHZ ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
4. 2.5GHZ ANTENNA MUST BE AT LEAST 6' FROM 1.9GHZ ANTENNA, 30" FROM 800MHZ ANTENNA AND 30" FROM DUAL BAND 1.9GHZ AND 800MHZ ANTENNA.
5. GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREE. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL.

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CT33XC584-C

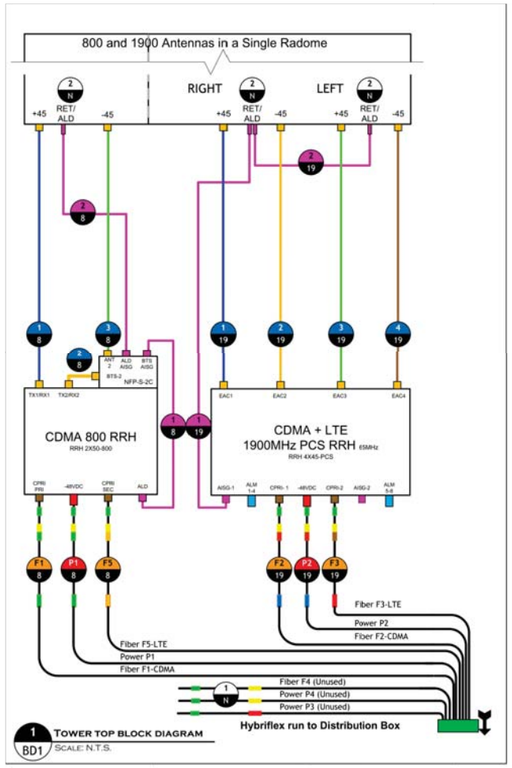
PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
2.5 RF DATA SHEET

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-5

TOWER TOP SCENARIO 124



1 BD1 TOWER TOP BLOCK DIAGRAM
SCALE: N.T.S.

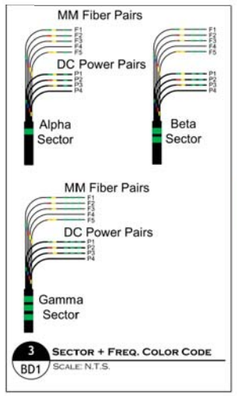
Power Feed Polarity Definition:
IF wires are BLACK AND BLACK/ WHITE STRIPE:
Black= -48VDC Feed (Battery)
Black/White Stripe= Return

IF wires are RED AND BLACK:
Red= -48VDC Feed (Battery)
Black= Return

NOTE: For power feed use the same Hybriflex OEM color designator as the fiber.

MM Pair 1= F1= Green= P1(Green)
MM Pair 2= F2= Blue= P2(Blue)
MM Pair 3= F3= Red= P3(Red)
MM Pair 4= F4= Yellow= P4(Yellow)
MM Pair 5= F5= Orange= (No P5 power feed)

2 BD1 HYBRIFLEX OEM COLOR CODE
SCALE: N.T.S.



3 BD1 SECTOR + FREQ. COLOR CODE
SCALE: N.T.S.

4 BD1 DIAGRAM LEGEND
SCALE: N.T.S.

ANTENNA PLUMBING DIAGRAM
SCALE: NTS
1

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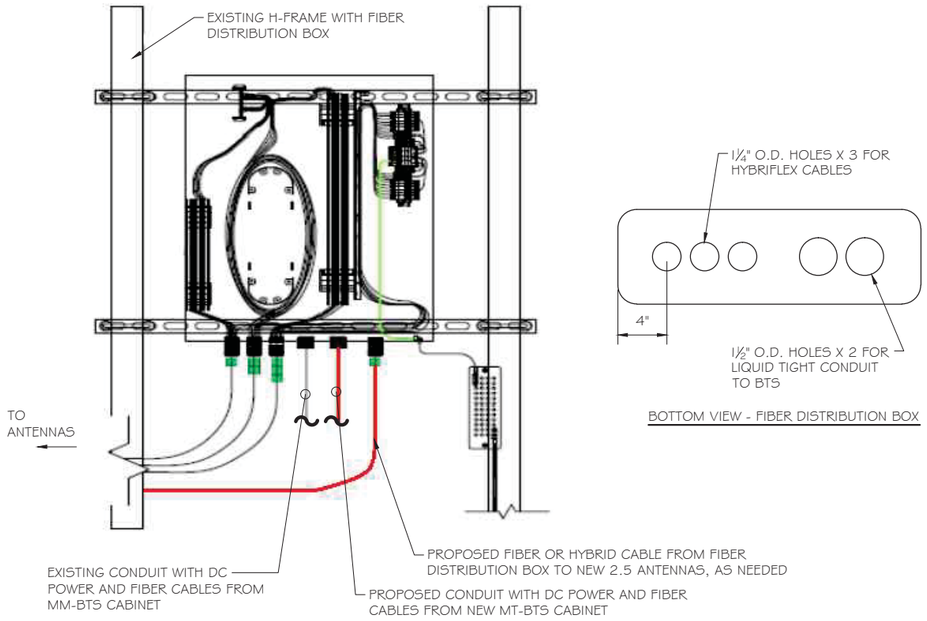
NEW LONDON

SHEET TITLE:
NETWORK VISION PLUMBING DIAGRAM

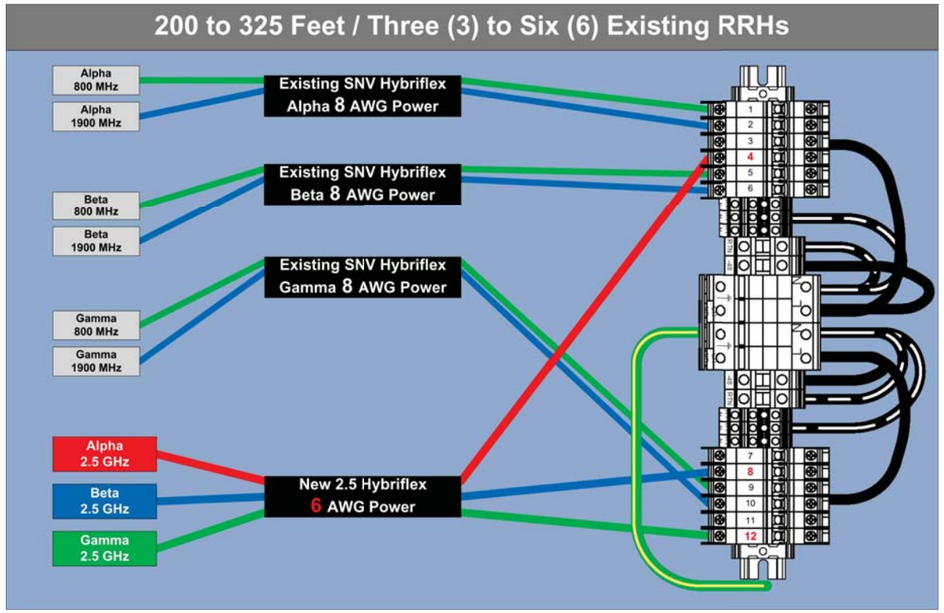
SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-6

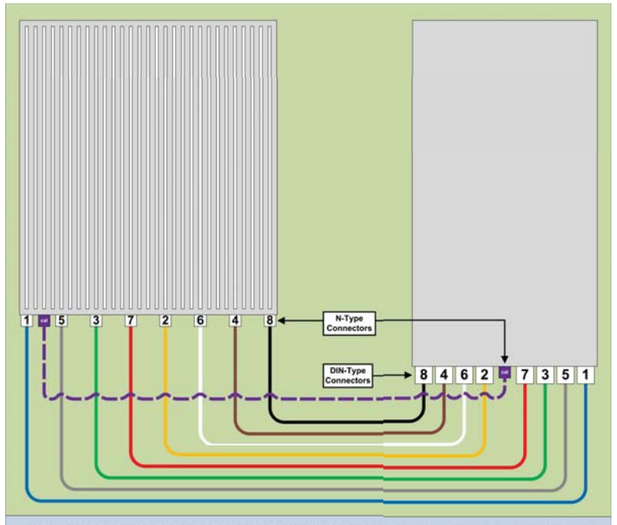


TYPICAL FIBER DISTRIBUTION BOX DETAIL (1)
SCALE: NTS

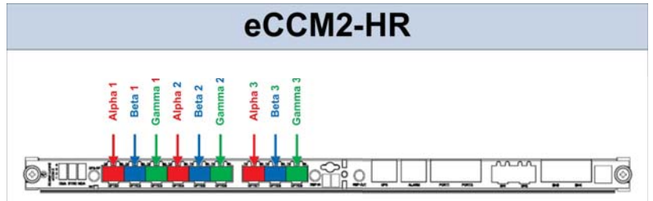
BOTTOM VIEW - FIBER DISTRIBUTION BOX

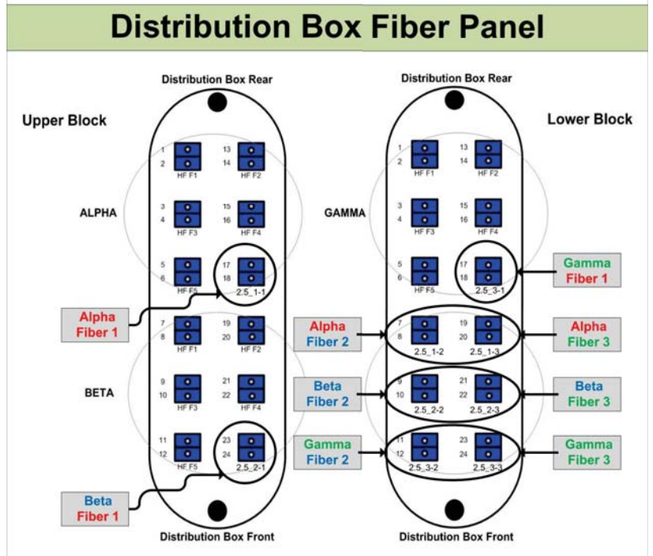


RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL (2)
SCALE: NTS



8T8R DETAIL (3)
SCALE: NTS





BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (4)
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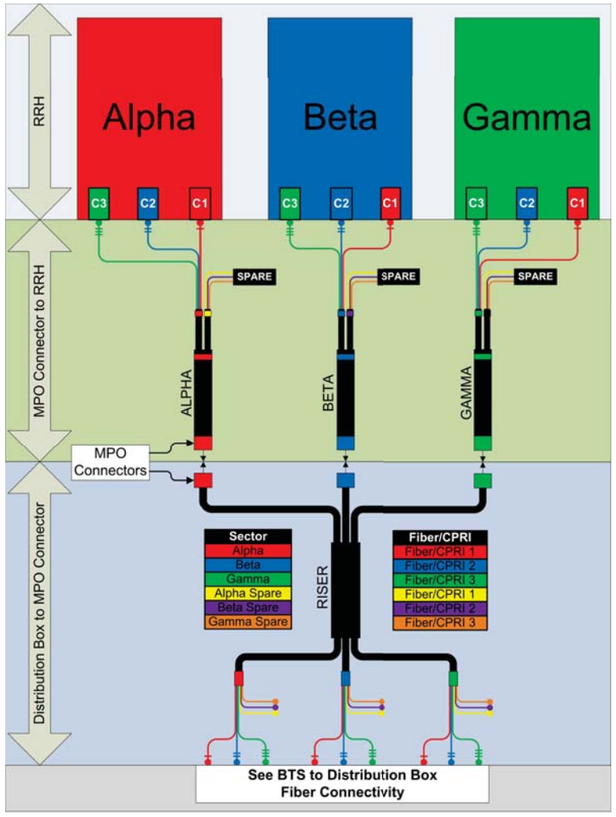

RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (5)
SCALE: NTS

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/15/2015

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DATE ISSUED: 01/15/2015

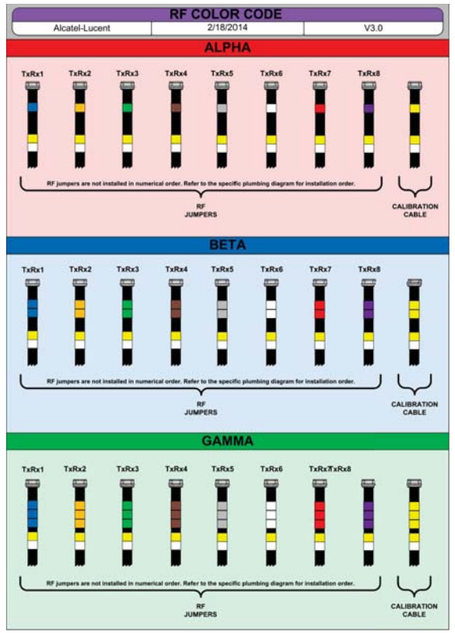
PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
FIBER PLUMBING DIAGRAM

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-7



SECTOR COLOR CODING AND BANDING (1)
SCALE: NTS

2.5 Coaxial Cable Color Code (Radio#1)

Sector	Cable	Start at Connector Side	Wrap2	Wrap3	Wrap4	Wrap5
1 Alpha	1	Blue			Yellow	White
1	2	Orange			Yellow	White
1	3	Green			Yellow	White
1	4	Brown			Yellow	White
1	5	Slate			Yellow	White
1	6	White			Yellow	White
1	7	Red			Yellow	White
1	8	Violet			Yellow	White
1	Calibration Cable	Yellow			Yellow	White
2 Beta	1	Blue	Blue		Yellow	White
2	2	Orange	Orange		Yellow	White
2	3	Green	Green		Yellow	White
2	4	Brown	Brown		Yellow	White
2	5	Slate	Slate		Yellow	White
2	6	White	White		Yellow	White
2	7	Red	Red		Yellow	White
2	8	Violet	Violet		Yellow	White
2	Calibration Cable	Yellow	Yellow		Yellow	White
3 Gamma	1	Blue	Blue	Blue	Yellow	White
3	2	Orange	Orange	Orange	Yellow	White
3	3	Green	Green	Green	Yellow	White
3	4	Brown	Brown	Brown	Yellow	White
3	5	Slate	Slate	Slate	Yellow	White
3	6	White	White	White	Yellow	White
3	7	Red	Red	Red	Yellow	White
3	8	Violet	Violet	Violet	Yellow	White
3	Calibration Cable	Yellow	Yellow	Yellow	Yellow	White

2.5 Coaxial Cable Color Code (Radio#2)

Sector	Cable	Start at Connector Side	Wrap2	Wrap3	Wrap4	Wrap5
1 Alpha	1	Blue			Yellow	Violet
1	2	Orange			Yellow	Violet
1	3	Green			Yellow	Violet
1	4	Brown			Yellow	Violet
1	5	Slate			Yellow	Violet
1	6	White			Yellow	Violet
1	7	Red			Yellow	Violet
1	8	Violet			Yellow	Violet
1	Calibration Cable	Yellow			Yellow	Violet
2 Beta	1	Blue	Blue		Yellow	Violet
2	2	Orange	Orange		Yellow	Violet
2	3	Green	Green		Yellow	Violet
2	4	Brown	Brown		Yellow	Violet
2	5	Slate	Slate		Yellow	Violet
2	6	White	White		Yellow	Violet
2	7	Red	Red		Yellow	Violet
2	8	Violet	Violet		Yellow	Violet
2	Calibration Cable	Yellow	Yellow		Yellow	Violet
3 Gamma	1	Blue	Blue	Blue	Yellow	Violet
3	2	Orange	Orange	Orange	Yellow	Violet
3	3	Green	Green	Green	Yellow	Violet
3	4	Brown	Brown	Brown	Yellow	Violet
3	5	Slate	Slate	Slate	Yellow	Violet
3	6	White	White	White	Yellow	Violet
3	7	Red	Red	Red	Yellow	Violet
3	8	Violet	Violet	Violet	Yellow	Violet
3	Calibration Cable	Yellow	Yellow	Yellow	Yellow	Violet

2.5 COAXIAL CABLE COLOR CODE (2)
SCALE: NTS

CABLE MARKING NOTES

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
4. THE 2" COLORED TAPE(S) SHALL BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE
6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
CABLE COLOR CODING

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-8

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
MANUF:RFS

CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
Fiber Only	Varies	Use NV Hybriflex	5/8"
Hybriflex	<200'	8 AWG	1-1/4"
Hybriflex	225-300'	6 AWG	1-1/4"
Hybriflex	325-375'	4 AWG	1-1/4"

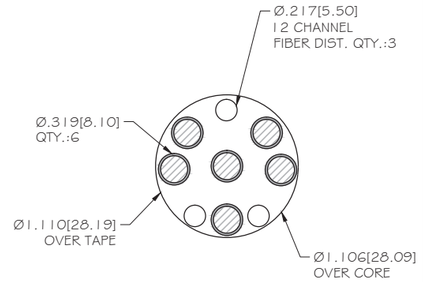
RFS HYBRIFLEX RISER CABLE SCHEDULE

FIBER ONLY (EXISTING DC POWER)	Hybrid cable MN:HB058-M12-050F 12x multi-mode fiber pairs, Top:Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50 ft	50 ft
	MN:HB058-M12-075F	75 ft
	MN:HB058-M12-100F	100 ft
	MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN:HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 50 ft	50 ft
	MN:HB114-08U3M12-075F	75 ft
	MN:HB114-08U3M12-100F	100 ft
	MN:HB114-08U3M12-125F	125 ft
	MN:HB114-08U3M12-150F	150 ft
	MN:HB114-08U3M12-175F	175 ft
	MN:HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN:HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 225 ft	225 ft
	MN:HB114-13U3M12-250F	250 ft
	MN:HB114-13U3M12-275F	275 ft
	MN:HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN:HB114-21U3M12-325F 3x 4 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 325 ft	325 ft
	MN:HB114-21U3M12-350F	350 ft
	MN:HB114-21U3M12-375F	375 ft

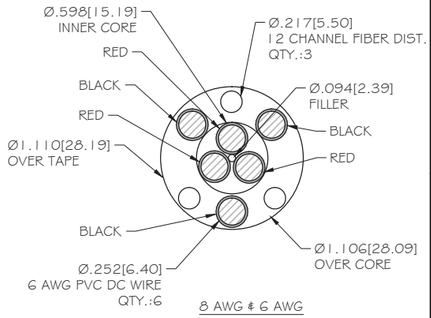
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

FIBER ONLY	Hybrid Jumper cable MN:HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN:HBF012-M3-10F1	10 ft
	MN:HBF012-M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
8 AWG POWER	Hybrid Jumper cable MN:HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-08U1M3-10F1	10 ft
	MN:HBF058-08U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
6 AWG POWER	Hybrid Jumper cable MN:HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-13U1M3-10F1	10 ft
	MN:HBF058-13U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
4 AWG POWER	Hybrid Jumper cable MN:HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 7/8 cable	5 ft
	MN:HBF078-21U1M3-10F1	10 ft
	MN:HBF078-21U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	

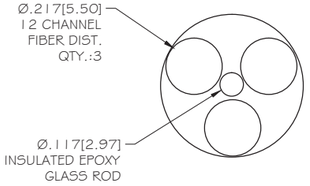
*NOTE: SPRINT CM TO CONFIRM HYBRID/FIBER RISER CABLE & HYBRID/FIBER JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.



4 AWG



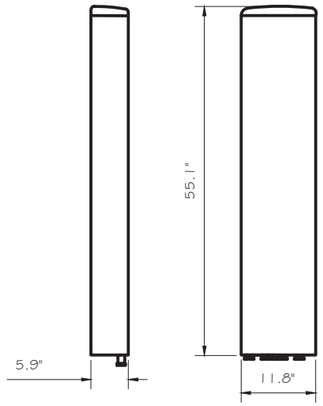
8 AWG & 6 AWG



FIBER ONLY

RFS: APXV9TM14-ALU-120

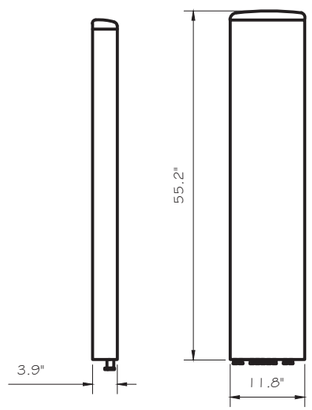
DIMENSIONS, HxWxD:	55.1" x 11.8" x 5.9"
WEIGHT, WITHOUT PRE-MOUNTED BRACKETS:	33 lbs.
CONNECTOR:	(9) DIN FEMALE/BOTTOM



2.5 ANTENNA DETAIL (2)
SCALE: NTS

RFS: APXVSPP18-C-A20

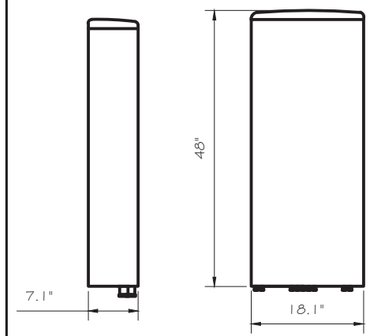
DIMENSIONS, HxWxD:	72" x 11.8" x 7"
WEIGHT, WITHOUT PRE-MOUNTED BRACKETS:	57 lbs.
CONNECTOR:	(4) 7-16 LONG NECK FEMALE/BOTTOM



NETWORK VISION ANTENNA DETAIL (3)
SCALE: NTS

KMW: ET-XU-42-15-37-18

DIMENSIONS, HxWxD:	48" x 18.1" x 7.1"
WEIGHT, WITHOUT PRE-MOUNTED BRACKETS:	50 lbs.
CONNECTOR:	(9) XX" MINI-DIN FEMALE/ BOTTOM



NETWORK VISION ANTENNA DETAIL (4)
SCALE: NTS

HYBRID CABLE CROSS SECTION & DATA (1)
SCALE: NTS

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CT33XC584-C

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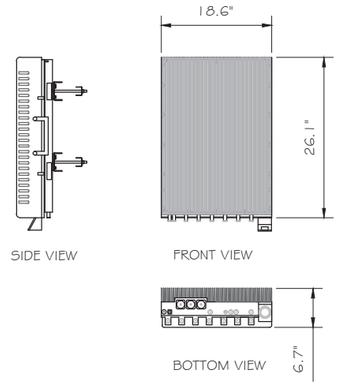
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
ANTENNA & HYBRID CABLE DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-9

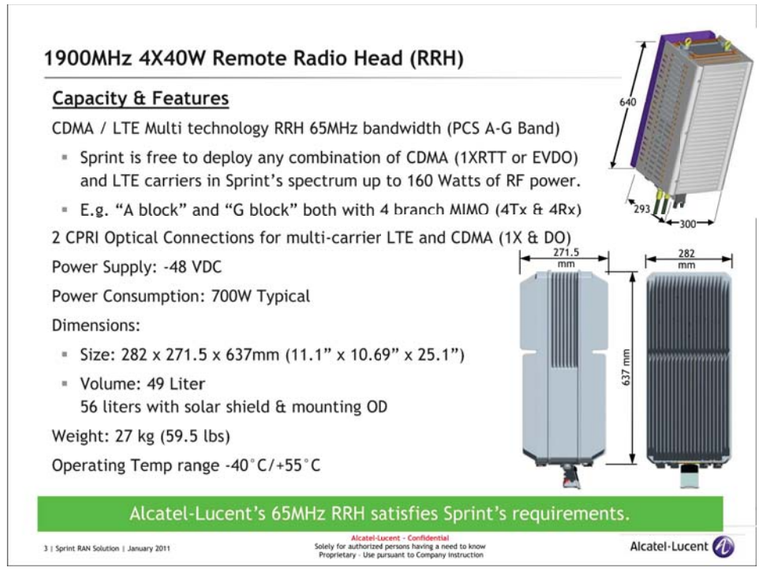


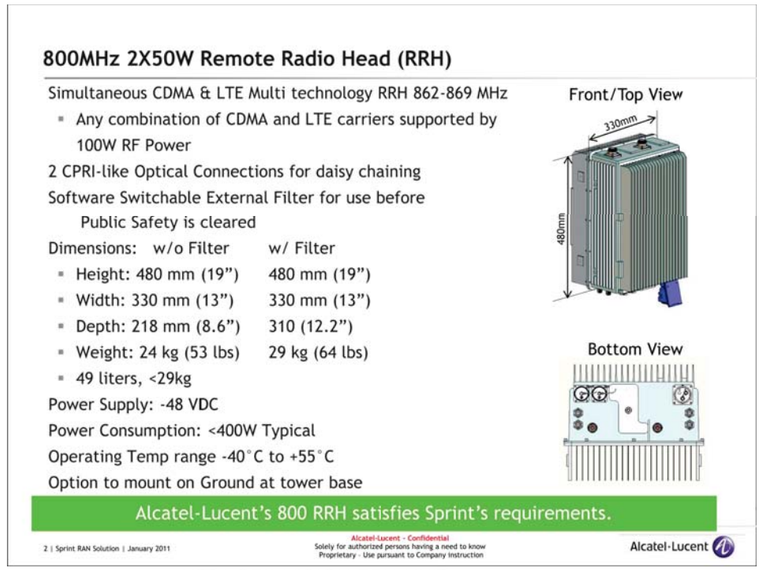
ALCATEL-LUCENT: TD-RRH8x20

HxWxD = (26.1" x 18.6" x 6.7")

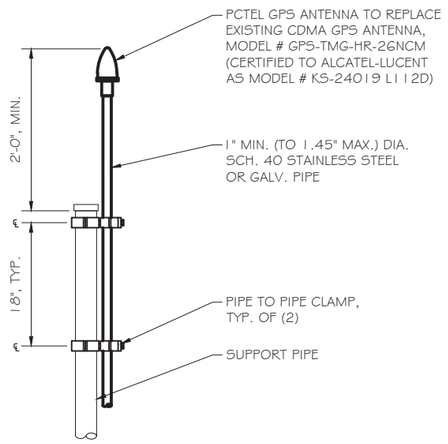
WEIGHT = 70 lbs.

2.5 RRH DETAIL
SCALE: NTS





NETWORK VISION RRH UNIT DETAILS
SCALE: NTS



GPS MOUNTING DETAIL
SCALE: NTS

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NEW LONDON

SHEET TITLE:
ANTENNA & RRH DETAILS

SCALE:
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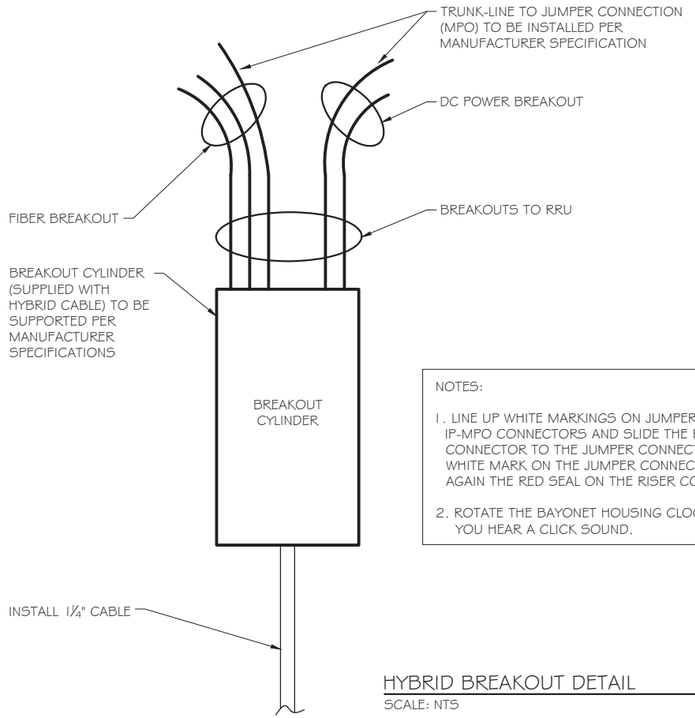
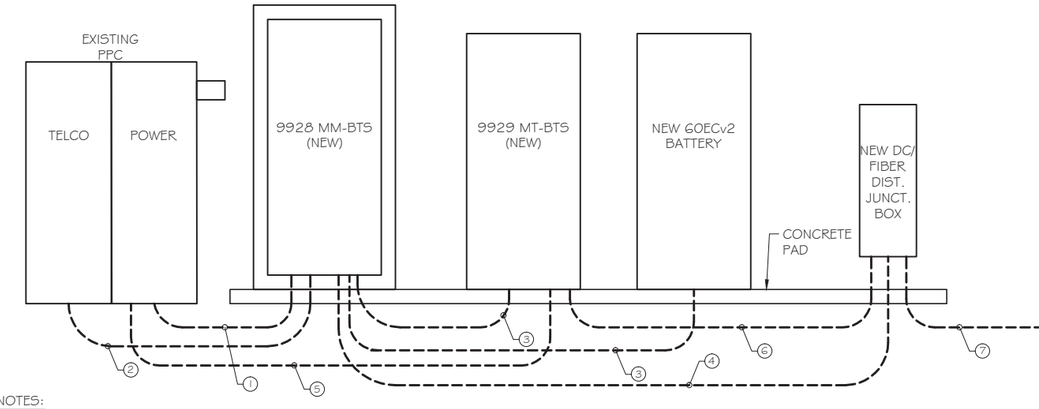
PROJECT NUMBER: 29461
SHEET NUMBER: A-10



NOTES:

1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.
2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND.

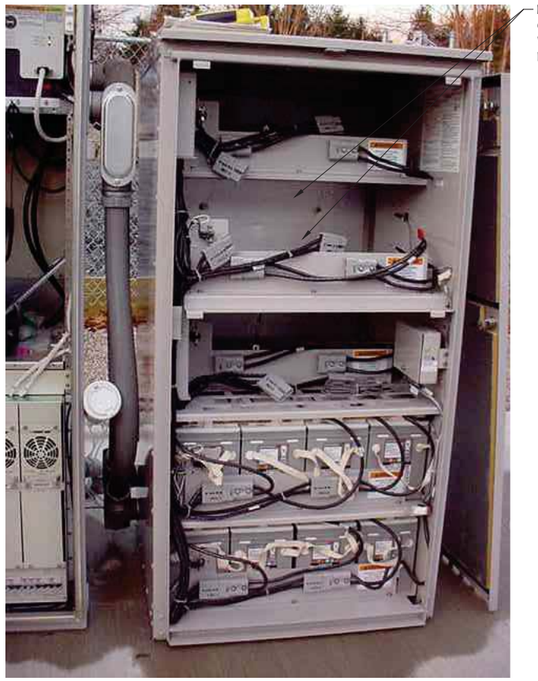
HYBRID BREAKOUT DETAIL (1)
SCALE: NTS



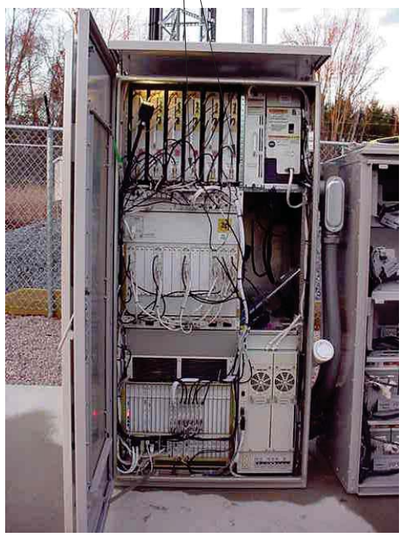
KEY NOTES:

1. CONTRACTOR TO USE EXISTING 100A, 2 POLE BREAKER IN EXISTING PPC. VERIFY EXISTING CONDUCTORS ARE (3) #3 AWG OR LARGER. IF NOT, CONTRACTOR TO REPLACE UNDERSIZED ITEM(S).
NOTE: #1 AWG REQUIRED IF TERMINALS ON EACH END OF INPUT CONDUCTORS ARE NOT MARKED "75° C".
2. CONTRACTOR TO PROVIDE (1) 2" EMPTY CONDUIT WITH HEAVY DUTY PULLSTRING FROM EXISTING PPC TO NEW 9928 MM-BTS.
3. INSTALL CONNECTION KITS FROM NEW 9928 MM-BTS TO NEW 9929 GROWTH CABINET AND NEW BATTERY CABINET.
4. (2) PROPOSED 1½" PVC CONDUITS (1 POWER, 1 FIBER). GALVANIZED STEEL OR LIQUID-TIGHT FLEXIBLE CONDUITS ACCEPTABLE AT CM'S DISCRETION. LIQUID-TIGHT CONDUIT LENGTHS NOT TO EXCEED 6'-0".
5. CONTRACTOR TO INSTALL NEW 100A, 2 POLE BREAKER IN EXISTING PPC & PROVIDE 2" CONDUIT WITH POWER FEED FROM NEW 9929 MT-BTS CABINET TO PPC AC PANEL (#3 AWG OR LARGER)
NOTE: #1 AWG REQUIRED IF TERMINALS ON EACH END OF INPUT CONDUCTORS ARE NOT MARKED "75° C".
6. INSTALL CONNECTION KIT FROM NEW 9929 MT-BTS TONEW FIBER DISTRIBUTION BOX.
7. INSTALL (4) NEW 1¼" HYBRID CABLES FROM FIBER DISTRIBUTION BOX TO NEW ANTENNAS. ROUTE ALONG EXISTING CABLING IN CABLE TRAY.

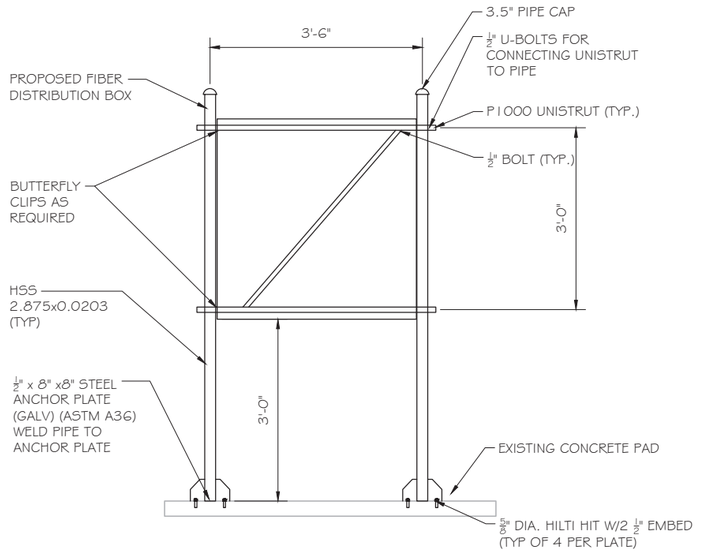
EQUIPMENT CONDUIT ROUTING DIAGRAM (2)
SCALE: NTS

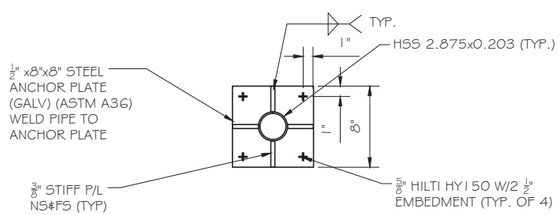


EXISTING BBU CABINET (3)
SCALE: NTS



EXISTING MMBS CABINET (4)
SCALE: NTS





DISTRIBUTION CABINET MOUNT (5)
SCALE: NTS

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/15/2015

MARK	DATE	DESCRIPTION
A	01/15/15	FINAL CDs ISSUED

ISSUE PHASE: FINAL
DATE ISSUED: 01/15/2015

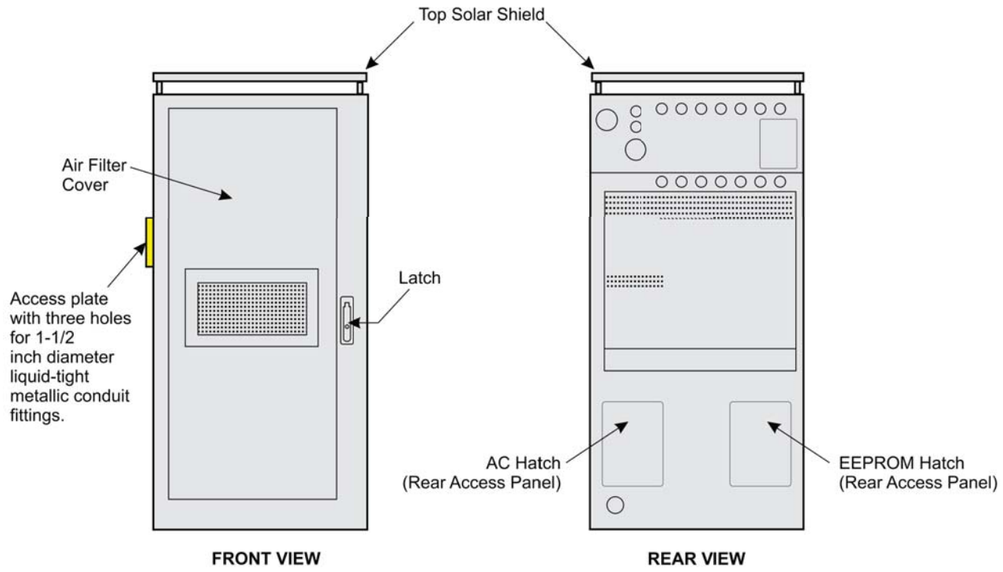
PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

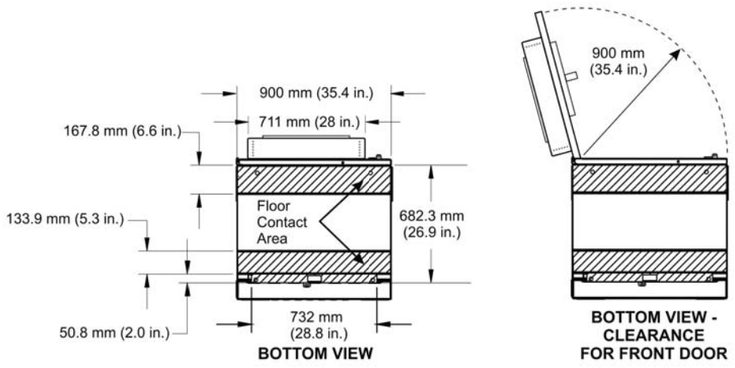
PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
EQUIPMENT DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-11





Cabinets	Configuration	Shipped Weight including pallet (estimate)	Maximum Installed Weight (estimate)	Reference Dimensions (Width x Depth x Height)
9928 Distributed Base Station Outdoor Cabinet with Integrated Power	Half loaded • CDMA • One BBU • One 7210 • One SAR 8 • Three DC-DC convertors	470 kg (1033 lbs)	430 kg (945 lbs)	900 mm x 960 mm x 1925 mm (35.4 inches x 37.8 inches x 75.8 inches)
	Fully loaded • CDMA • Four BBUs • Two 7210s • One SAR 8 • Six DC-DC convertors • 8 Injectors	529 kg (1162 lbs)	489 kg (1074 lbs)	

9928 DISTRIBUTED BASE STATION OUTDOOR CABINET DETAIL (1)
SCALE: NTS

FRONT VIEW
GOECv2 BATTERY CABINET
(FRONT DOOR REMOVED)

REAR VIEW
GOECv2 BATTERY CABINET
(REAR PANEL REMOVED)

General Specifications

Cabinet Dimensions:	Height: 60 in. (152.4 cm) Width: 31 in. (78.7 cm) Depth: 30 in. (76.2 cm)
Approximate Weight:	425 lbs., (Empty)
Cabinet Operating Temperature Range:	-40°C to 46°C

BATTERY CABINET DETAILS (2)
SCALE: NTS

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Signature: James R Skowronski Date: 1/15/2015

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ISSUE PHASE: FINAL
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PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
9928 BTS & BATTERY SPECS

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-12

ALCATEL-LUCENT
9929 MULTI TECHNOLOGY BTS
OUTDOOR CABINET

In order to help network operators to improve TCO for distributed radio based sites with extended battery backup requirements, Alcatel-Lucent proposes the 9929 Multi Technology Outdoor Cabinet for CDMA/LTE/WCDMA multi-standard configurations

9929 MT-BTS OUTDOOR CABINET

- The 9929 MT-BTS cabinet is designed to provide, in a single footprint, a full site support with a capability to host 3G and 4G Telecom equipment with internal power and battery support.
- The 9929 MT-BTS Outdoor Cabinet offers 17.5 U of user space capable of hosting 19" rack based telecom equipment and rectification. The 9929 MT-BTS supports distributed RF deployment scenarios with the hosting of Digital base band unit and transport equipment.
- The 9929 MT-BTS cabinet can host up of 2 strings of batteries.
- The 9929 MT-BTS is AC powered and can deliver up to 10.5kW of -48V DC power thanks to its internal N+1 redundant rectifier.
- The 19" modules could have either front-back or side-side cooling. The cabinet uses direct air-cooling (fresh air filter) technology on front door to provide 8000 W of cooling capacity. A wide temperature operating range (-40°C to +50°C full operation) allows the deployment of this cabinet in various locations.
- The 9929 MT-BTS cabinet is compliant with Zone 4 earthquake regulations.
- As an matter of example the following configuration is supported by the cabinet:
  - ✓ Distributed configuration: AC configuration with up to 10.5kW DC Power, up to 3 baseband units, 2U service aggregation router, 2U of microwave transport equipment, up to 2 battery of 190AH.

FEATURES

- Can host BBU(s) for CDMA/WCDMA/LTE
- Supports standard 19" Telecom equipment
- Uses Direct Air Cooling (no air conditioning) with fan speed control based upon temperature
- Support of up to two 190 Ah or up to two 145AH battery strings that can provide backup for 8 hours for up to 2375 W, or 4 hour backup for up to 4150
- Convenience AC outlet (2)

TECHNICAL SPECIFICATIONS

INTERFACE:

¬ CPRI (up to 9 RRH modules)
¬ Backhaul (Gigabit Ethernet or T1)
¬ External user alarms (up to 32 user alarms)
¬ AC Power input
¬ DC Power input for RRH (up to 9 RRH's)

PHYSICAL DIMENSIONS

¬ Height: 1617 mm (63.65 in)
¬ Width: 800 mm (31.5 in)
¬ Depth: 900 mm (35.5 in)

WEIGHT

¬ 197 kg (434 lbs) unloaded
¬ Up to 725 kg (1600 lbs) fully loaded

POWER

Power supply:
¬ -48 VDC
¬ 230V AC (single phase or 3 phases)
Rectifier:
¬ up to 10.5kW DC -48V output power
¬ Rectifier redundancy N+1

OPERATING ENVIRONMENT

¬ Outdoor temperature range: -40°C to +50°C
¬ Direct Air Cooling
¬ Enclosure:
¬ IP55 (International Protection rating)
¬ Zone 4 Earthquake

STANDARDS COMPLIANCY

¬ UL 60950-1 / CAN/CSA C22.2 No. 60950-1-07
¬ UL 50/50E CSA C22.2 No. 94.1- 07/94.2-07
¬ EN50272-2
¬ EIA-310-D

EMC& ENVIRONNEMENTAL CONDITIONS

¬ FCC Part 15 class B
¬ GR-63-CORE,
¬ GR-487-CORE,
¬ GR-1089-CORE

SUPPORTED TELECOM EQUIPMENT

¬ LTE 9926 BBU
¬ CDMA 9926 BBU
¬ WDMA 9926 BBU
¬ SAR Aggregation router
¬ Microwave Indoor Unit

AT THE SPEED OF IDEAS™ Alcatel·Lucent

Alcatel·Lucent

PROPOSED 9929 MT-BTS OUTDOOR CABINET
SCALE: NTS

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PROJECT TITLE:
CITADEL/GROTON
CT33XC584-C

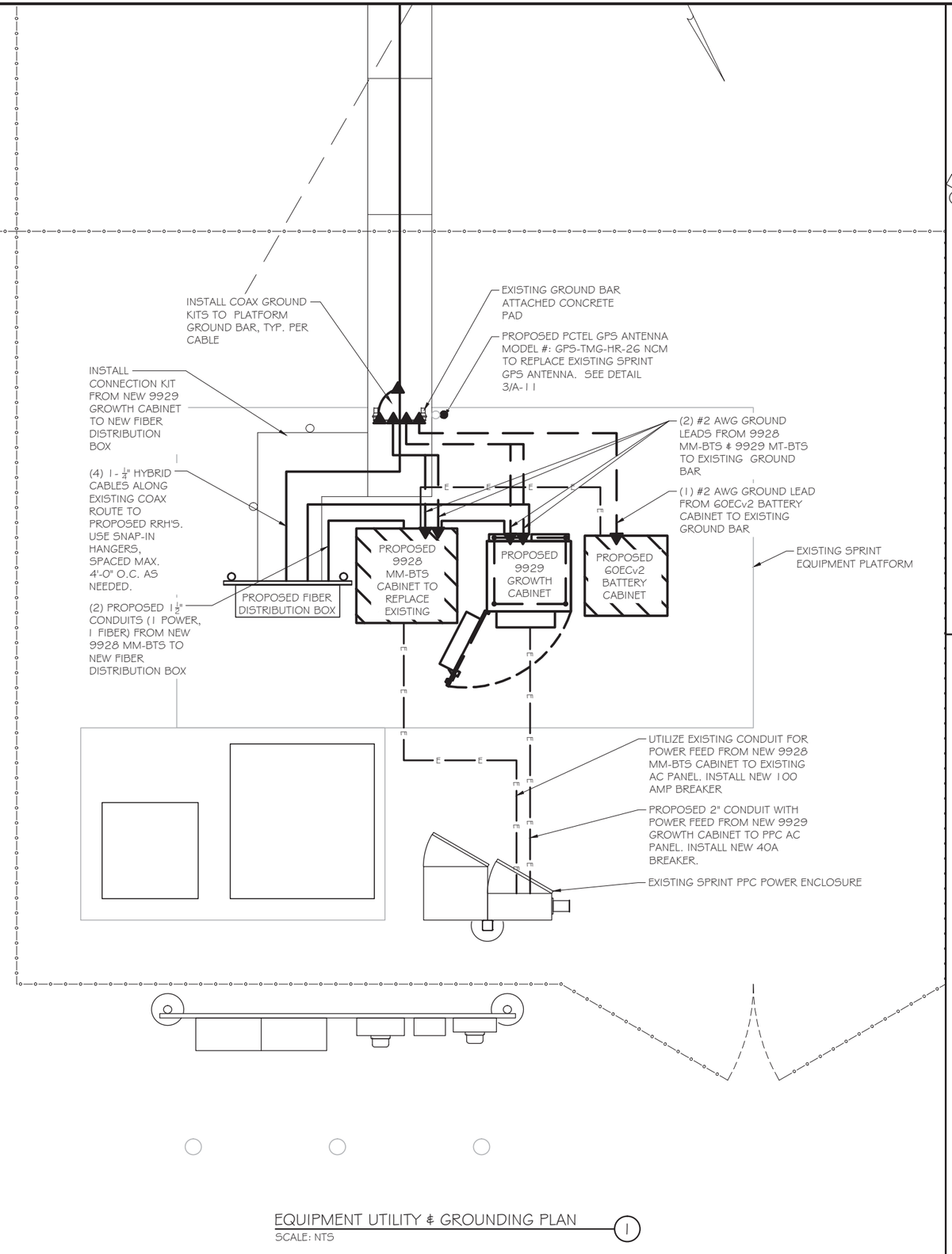
PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
9929 CABINET SPECS

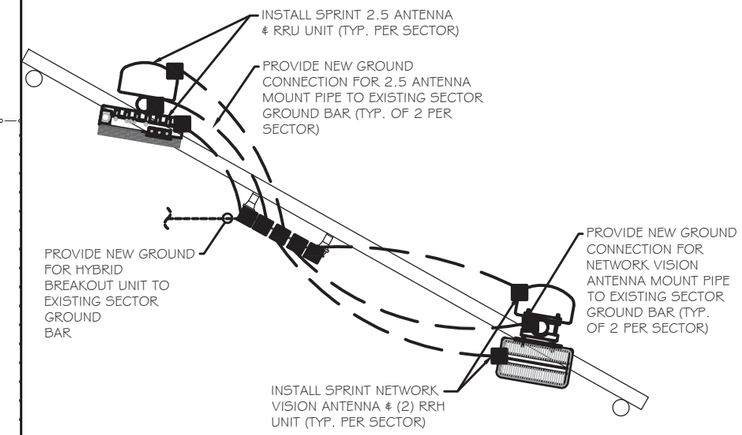
SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: A-13

DRAWN BY: KJG CHECKED BY: KAB



EQUIPMENT UTILITY & GROUNDING PLAN (1)
SCALE: NTS



ANTENNA GROUNDING DETAIL (2)
SCALE: NTS

GROUNDING NOTES:

1. CONTRACTOR TO ENSURE PROPER SEQUENCING OF GROUNDING AND UNDERGROUND CONDUIT INSTALLATION TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM AND/OR DAMAGE TO THE CONDUIT.
2. ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG SOLID TINNED COPPER UNLESS NOTED OTHERWISE.
3. ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADWELD).
4. ALL GROUND CONNECTIONS ABOVE GRADE AND/OR INTERIOR SHALL BE COMPRESSION TYPE, TWO-HOLE LUGS OR DOUBLE-CRIMP "C" TAPS.
5. CONTACT AREAS WHERE CONNECTIONS ARE MADE SHALL BE PREPARED TO A BARE BRIGHT FINISH AND COATED WITH AN ANTI-OXIDATION MATERIAL BEFORE CONNECTIONS ARE MADE.
6. MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS.
7. WHERE GROUNDING CONNECTIONS ARE MADE TO PAINTED METAL SURFACES, PAINT SHALL BE REMOVED TO BEAR METAL TO ENSURE PROPER CONTACT AND RESTORED/PAINTED TO ORIGINAL FINISH.
8. GROUND DEPTH SHALL BE 30" MINIMUM BELOW FINISHED GRADE, OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.

LEGEND:	
– – – – – – – – – – – –	EXISTING GROUND CABLE
▬▬▬▬▬▬▬▬▬▬▬▬	PROPOSED GROUND CABLE
▲	MECHANICAL CONNECTION
■	EXOTHERMIC CONNECTION
—E—E—E—E—	PROPOSED ELECTRIC

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CITADEL/GROTON
CT33XC584-C

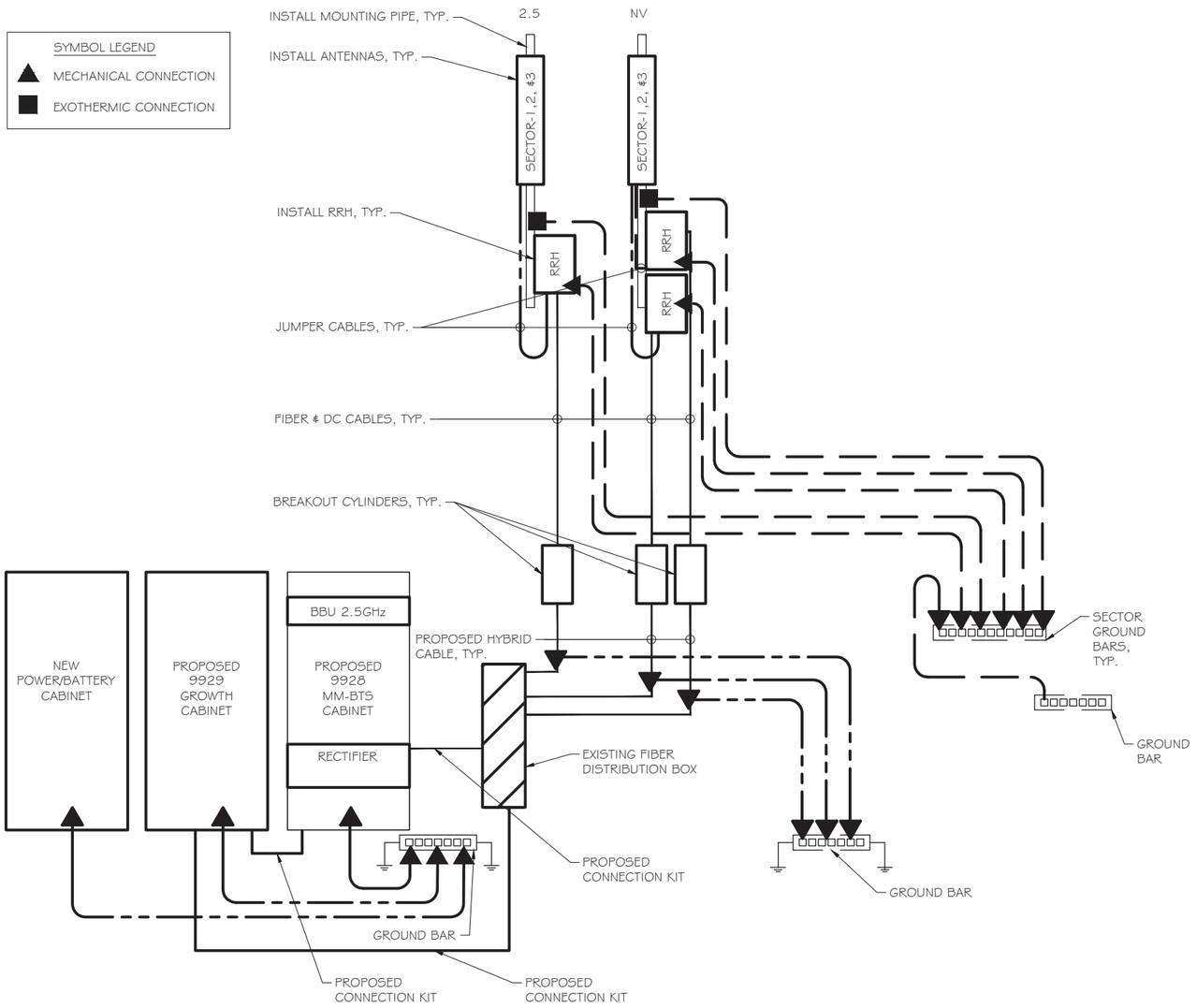
PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
EQUIPMENT UTILITY & GROUNDING PLAN

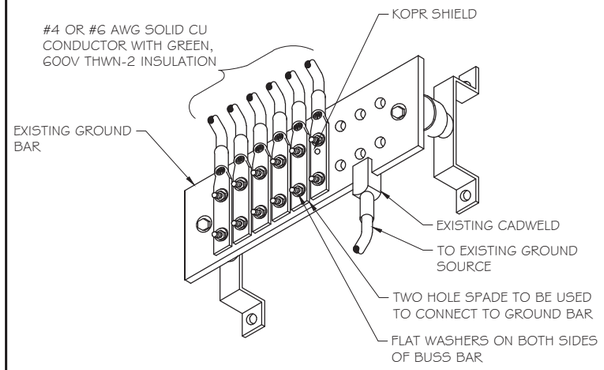
SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: E-1

DRAWN BY: KJG CHECKED BY: KAB



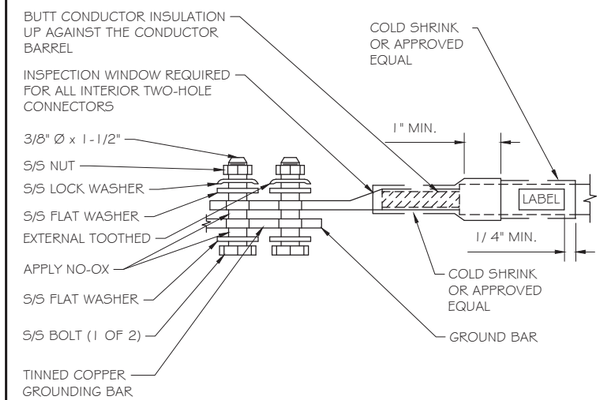
GROUNDING RISER DIAGRAM (1)
SCALE: NTS



NOTES:
1. APPLY NO-OX TO LUG AND GROUND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.

2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

GROUNDING CONDUCTOR INSTALLATION (2)
SCALE: NTS



TWO-HOLE LUG (3)
SCALE: NTS

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CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
GROUNDING DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: E-2

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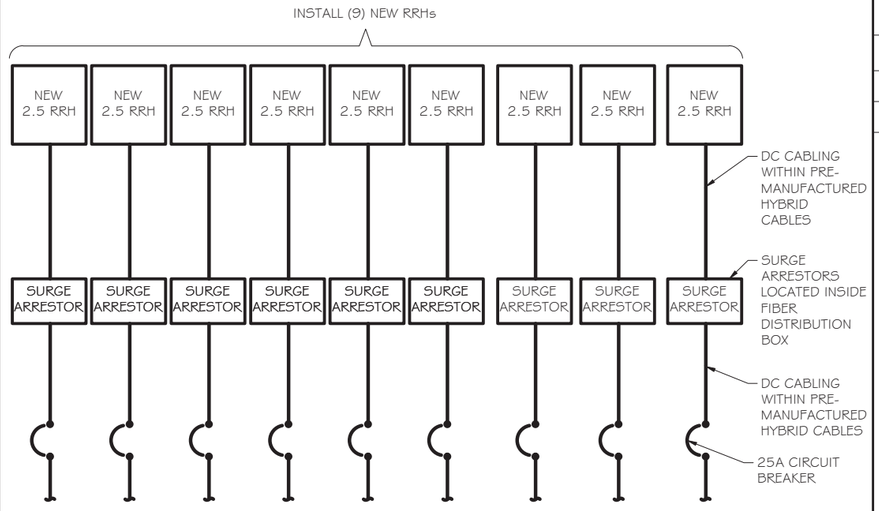


DC ONE-LINE DIAGRAM (1)
SCALE: NTS

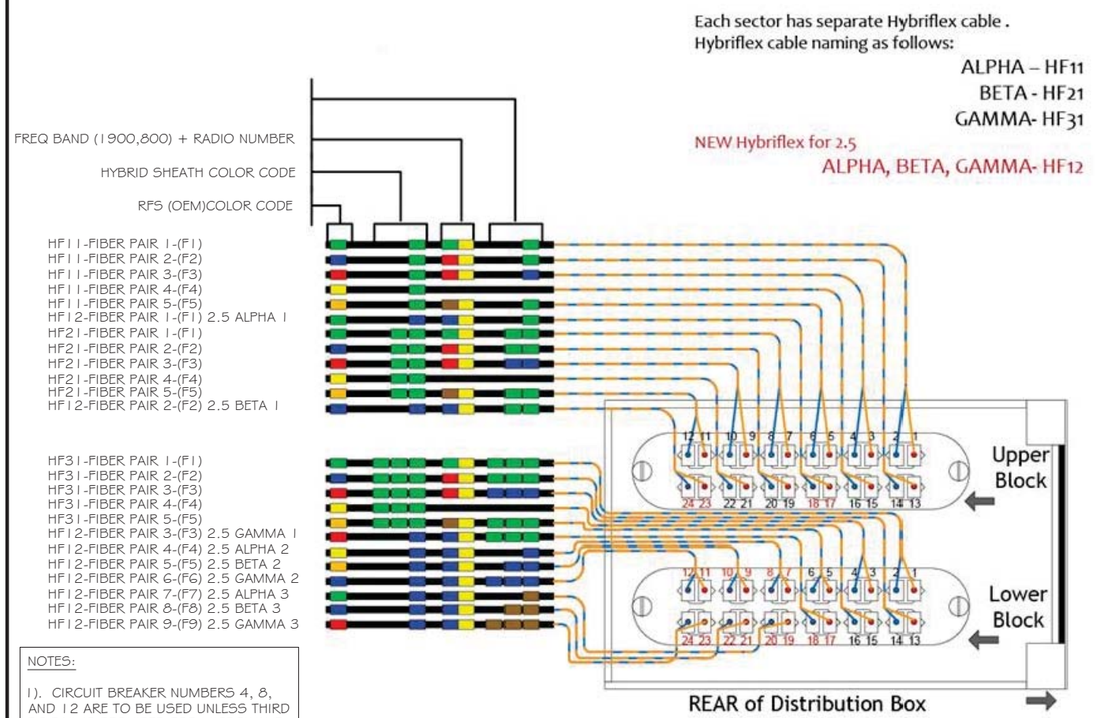
A/C PANEL SCHEDULE

VOLTAGE:	240V/120	PANEL STATUS:	EXISTING	N TO GROUND BOND:	YES
MAIN BREAKER:	200 AMP	MODEL NUMBER:	TBD	INTERNAL TVSS:	YES
MOUNT:	ROOFTOP	PHASE:	1	WIRE:	3
ENCLOSURE TYPE:	NEMA 3R	BUSS RATING:	200 AMP	GROUND BAR:	YES
		NEUTRAL BAR:	YES		

CKT	DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	PHASE A VA	PHASE B VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	DESCRIPTION	CKT
1	SURGE SUPPRESSOR	60	2	ON			ON	1	10	FAN	13
2							ON	1	10	GFI	14
3	*NEW 9928 MM-BTS	100	2	ON			ON	1	15	GEN HEATER	15
4							-	-	-	BLANK (UNUSED)	16
5	*NEW 9929 MT-BTS	40	2	ON			-	-	-	BLANK (UNUSED)	17
6							-	-	-	BLANK (UNUSED)	18
7	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	19
8	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	20
9	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	21
10	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	22
11	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	23
12	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	24

* UTILIZE EXISTING 100 A BREAKER FOR NEW 9928 MM-BTS CABINET AND REPLACE EXISTING 100A BREAKER WITH NEW 40A BREAKER FOR NEW 9929 MT-BTS CABINET.

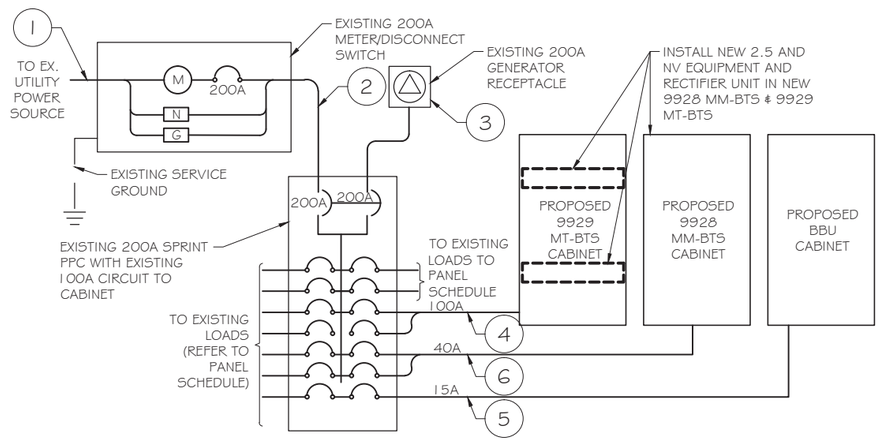
AC PANEL SCHEDULE (2)
SCALE: NTS



NOTES:

1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

TYPICAL FIBER DISTRIBUTION (3)
SCALE: NTS



CIRCUIT SCHEDULE			
NO.	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/ DISCONNECT	EXISTING
2	METER/ DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	NEW 9928 CABINET	(3) #2 AWG, (1) #8 GND IN 1½" CONDUIT
5	TRANSFER & LOAD CENTER	NEW BATTERY CABINET	(2) #12 AWG, (1) #12 GND IN ¾" CONDUIT
6	TRANSFER & LOAD CENTER	NEW 9929 CABINET	(3) #2 AWG, (1) #8 GND IN 1½" CONDUIT

ELECTRICAL ONE-LINE DIAGRAM (4)
SCALE: NTS

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CT33XC584-C

PROJECT INFORMATION:
99 BRIAR HILL ROAD
GROTON, CT 06340
NEW LONDON

SHEET TITLE:
DC POWER DETAILS & PANEL SCHEDULES

SCALE:
AS NOTED

PROJECT NUMBER: 29461
SHEET NUMBER: E-3

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